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Tracing National Origins, Debating Ethnic Homogeneity: Population Genetics and the Politics of National Identity in South Korea

ABSTRACT

This article examines the interaction between human population genetics and the reconstruction of national identities and histories. Since the first use of mitochondrial DNA analysis of human origins in 1987, scientific research on population history using genetic technologies, or genetic history studies, has flourished, engaging with diverse politics of social identity and national belonging across the globe. Previous scholars have stated that a distinct feature of genetic history studies is the globalized research and commercial network enabled by technological innovations and social transformations during the 1990s. This paper contributes further to this literature by analyzing how local geneticists became part of the global research network and how globalization at large—e.g., economic liberalization and the rise of multiculturalism—functioned in the development of genetic history studies in South Korea. By focusing on a leading population geneticist, Kim Wook and his genetic origin research on Koreans, I will show the role that Korean geneticists had in reconfiguring Korean national identity—from an ethnically homogeneous group to an ethnically diverse one—while their research practices, questions, and methods were inspired and supported by domestic globalization policies and discourses and a transnational network of genetic history studies. I will also reveal the essential, albeit equivocal, part genetic knowledge played in the debate on national belonging in this county.

KEY WORDS: genetic history, globalization, the politics of national identity, population genetics, South Korea

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The following abbreviations are used: GRF, Goguryeo Research Foundation; KOSEF, Korean Science and Engineering Foundation; mtDNA, mitochondrial DNA; NFS, Korean National Forensic Service; NRICH, Korean National Research Institute of Cultural Heritage Administration; YCC, Y Chromosome Consortium.

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INTRODUCTION

Historians of biology have been concerned with the way in which genetic knowledge and technologies have contributed to a reconstruction of ethnic, national, and racial identities and histories. The development of restriction enzyme analysis of mitochondrial DNA (mtDNA) in the 1980s allowed population geneticists to study histories of human populations on the DNA level and made them more actively engaged with identity politics. Although in some places the new grouping or new narratives of a specific population as informed by genetics have provoked the direct exclusion or inclusion of specific populations in public health and other social policy regimes, identity politics occurs on various levels, such as the formation of classifications and genealogical knowledge, and the biological reification of political and cultural identities. In this respect, scholars have focused on the redefining of national boundaries and the rethinking of the collective past using genetic knowledge to examine genetic science's involvement with the politics of national identity.[1]

Although population geneticists claimed the scientific objectiveness of their work reconstructing national, regional, and global histories of human populations using DNA technologies and its power to dispute cultural prejudices such as racism and nationalism, historians have shown that cultural and historical concepts have influenced the formulation of research questions, sampling practices, and interpretations of genetic data in genetic history studies.[2] For instance, historical narratives and political and social groupings of human populations are reflected in the a priori classifications used in genetic history

1. Katharina Schramm, David Skinner, and Richard Rottenburg, "Introduction: Ideas in Motion—Making Sense of Identity Politics and the New Genetics," in *Identity Politics and the New Genetics: Re/Creating Categories of Difference and Belonging*, ed. Katharina Schramm, David Skinner, and Richard Rottenburg (Oxford: Berghahn Books, 2012), 1–29; Keith Wailoo, Alondra Nelson, and Catherine Lee, "Introduction: Genetic Claims and the Unsettled Past," in *Genetics and the Unsettled Past: The Collision of DNA, Race, and History*, ed. Keith Wailoo, Alondra Nelson, and Catherine Lee (New Brunswick, NJ: Rutgers University Press, 2012), 1–10.

2. Stanford population geneticist L. Luca Cavalli-Sforza (born 1922) is a leading scientist concerning this issue. On his argument for the usefulness of population genetics (and the human diversity genome project) against racism, see Linda Stone and Paul F. Lurquin, *A Genetic and Cultural Odyssey: The Life and Work of L. Luca Cavalli-Sforza* (New York: Columbia University Press, 2005). For the critical analysis of Cavalli-Sforza's work concerning his idea of DNA-based genetic research as more objective and less culturally contaminated than anthropology, see Marianne Sommer, "Human Evolution across the Disciplines: Spotlights on American Anthropology and Genetics," *History and Philosophy of the Life Sciences* 34 (2012): 211–36.

research.[3] The Indian caste system, for example, and its historical origins are used for grouping in genetic studies on South Asian populations.[4] Historians have also examined how genetic history studies flourished by engaging with diverse politics of social identity and national belonging across the globe. In China, India, Taiwan, and Mexico, national genetic ancestry projects were initiated for the purpose of supporting social policy, justifying the existing government view of national identity, while claiming commercial ownership of their people's genetic information.[5] Ethnically or racially specific genetic projects were also eagerly promoted in the United States in the context of minority health movements and the commercialization of genetic ancestry testing.[6] Global genetic ancestry projects also prospered despite the political backlash from indigenous activist groups and harsh criticism from anthropologists and sociologists.[7]

One of the distinct features in genetic history research from the 1980s onward is its globalized form of research and commercial networks. It was new forms of information technology, including the Internet, and economic globalization after the collapse of the Eastern Bloc that rendered possible the dramatic increase in international collaborations and the amount of DNA data

3. Soraya de Chadarevian, "Genetic Evidence and Interpretation in History," *BioSocieties* 5 (2010): 301–05; Lisa Gannett and James R. Griesemer, "The ABO Blood Groups: Mapping the History and Geography of Genes in Homo Sapiens," in *Classical Genetic Research and Its Legacy: The Mapping Cultures of Twentieth Century Genetics*, ed. Hans-Jörg Rheinberger and Jean-Paul Gaudillière (New York: Routledge, 2004), 119–72.

4. Yulia Egorova, "DNA Evidence? The Impact of Genetic Research on Historical Debates," *BioSocieties* 5 (2010): 348–65, on 352.

5. Ruha Benjamin, "A Lab of Their Own: Genomic Sovereignty as Postcolonial Science Policy," *Policy and Society* 28 (2009): 341–55; Margaret Sleeboom-Faulkner, "How to Define a Population: Cultural Politics and Population Genetics in the People's Republic of China and the Republic of China," *BioSocieties* 1 (2006): 399–419; Yulia Egorova, "The Substance that Empowers? DNA in South Asia," *Contemporary South Asia* 21 (2013): 291–303. On comparative research on national identity constructions through national genomic projects in Mexico and Brazil, see Michael Kent, Vivette García-Deister, Carlos López-Beltrán, Ricardo Ventura Santos, Ernesto Schwartz-Marín, and Peter Wade, "Building the Genomic Nation: 'Homo Brasilis' and the 'Genoma Mexicano' in Comparative Cultural Perspective," *Social Studies of Science* 45 (2015): 839–61.

6. Catherine Bliss, *Race Decoded: The Genomic Fight for Social Justice* (Stanford, CA: Stanford University Press, 2012); Kim TallBear, "Genomic Articulations of Indigeneity," *Social Studies of Science* 43 (2013): 509–33.

7. The human genome diversity project and the genographic project are well-known global genetic history initiatives. See Jenny Reardon, *Race to the Finish: Identity and Governance in an Age of Genomics* (Princeton, NJ: Princeton University Press, 2005); Marianne Sommer, "DNA and Cultures of Remembrance: Anthropological Genetics, Biohistories and Biosocialities," *BioSocieties* 5 (2010): 366–90.

available after the 1980s.[8] Indeed, anthropologists and sociologists of science have pointed out that the genetic reconstruction of racial and ethnic concepts, at the beginning of the twentieth-first century, occurred at the conjunction of new information technologies, economic globalization, and multiculturalism.[9]

This paper contributes to this literature by analyzing the way in which local scientists became a part of the globalized network and the role globalization at large played in the development of genetic history studies in South Korea.[10] From 1993, with the Korean government adopting a pro-immigration policy as part of the broader globalization policy (*Segyehwa*), multiculturalism became a part of the political agenda in Korean society. This boom in multiculturalism coincided with a fierce battle over widespread beliefs about Korean ethnic homogeneity. In parallel with socio-political change by the end of Cold War era and with the birth of new information technologies, the reach of scientific collaboration was expanded to extend beyond the scientifically developed countries of the Western Bloc. Such expansion allowed Korean geneticists to engage with a global research network on the genetic origins of human populations.

I argue that these geneticists subsequently became involved in the process of reconfiguring Korean national identity—from being viewed as an ethnically homogeneous group to being seen as an ethnically diverse one—while their research practices, questions, and methods were inspired and supported by domestic globalization policies and discourses and a transnational network of genetic history studies. Through this work, I will also reveal that genetic knowledge became an essential, albeit equivocal, part of the debate on national belonging in this country.

This paper gives special attention to Kim Wook (born 1953), a professor of population genetics at Dankook University, Cheonan, who was a leading scholar in genetic history and developed a dual-origins hypothesis to describe

8. On the emphasis of the Internet concerning the globalization of genetic history, see Marianne Sommer, *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2016), 333–34.

9. Peter A. Chow-White, "The Informationalization of Race: Communication, Databases, and the Digital Coding of the Genome," in *Genetics and the Unsettled Past: The Collision of DNA, Race, and History*, ed. Keith Wailoo, Alondra Nelson, and Catherine Lee (New Brunswick, NJ: Rutgers University Press, 2012), 81–103.

10. South Korea is hereafter referenced as Korea except for quotations and contexts in which North Korea is mentioned. This article adopts the McCune-Reischauer system for the romanization of Korean; all Korean and Japanese names in this article are listed in the order of surname first, followed by the given name. I transliterate names following the persons' preferences as presented in their English written publications.

Koreans. The dual-origins hypothesis, which posits that "the peopling of Korea is a complex process with northern Asian settlement followed by several migrations, mostly from Southern to Northern China," was generally accepted as a scientific criticism of a widespread belief in Korean ethnic homogeneity in both academic circles and the wider public.[11] The analysis of Kim Wook and his geneticist colleagues' work on the dual-origins hypothesis and the public reception of it will reveal genetic research as it developed and redefined the boundaries of national belonging in the context of globalization.

The first section describes the domestic political and social transformations in Korea and the emergence of a transnational research network on human evolution after the end of the Cold War. The second section examines the ways in which Korean geneticists began to study the genetic history of Koreans under the influence of this global scientific network, and Korea's new sociopolitical circumstances in the early 1990s and the early 2000s. This section centers on Kim Wook's work on the dual-origins hypothesis, which was the outcome of the localization of transnational science, reinterpreted to meet local political demands. The last section examines how the dual-origins hypothesis became an indispensable part of the debate on national identity in Korea for different political actors and geneticists themselves.

GLOBAL TRANSFORMATIONS IN SCIENCE AND SOCIETY

The Transformation of Politics and Society in the Globalization Era

The fall of the Berlin Wall in 1989 symbolized the end of the Cold War in the United States and Europe, but Korea had also been undergoing radical political changes. Impelled by the winds of change of democratic movements around the world, the June Democracy Movement of 1987 democratized Korean politics. A year later, while hosting the 1988 Summer Olympics, the government made moves to normalize relations with communist countries and attempted to change its, until that point, hostile attitude toward North Korea.[12]

11. Han-Jun Jin, Kyoung-Don Kwak, Michael F. Hammer, Yutaka Nakahori, Toshikatsu Shinka, Ju-Won Lee, Feng Jin, Xuming Jia, Chris Tyler-Smith, and Wook Kim, "Y-chromosomal DNA Haplogroups and Their Implications for the Dual-Origins of the Koreans," *Human Genetics* 114 (2003): 27–35.

12. Kim Soo Ja, "Development of Discussion about the Korean Nationalism after Democratization: From 1987 June Struggle to President Kim Dae-Jung's Government," *Social Science Studies* (in Korean) 14 (2006): 44–80.

This global political change rekindled the debate on Korean nationalism. As sociologist Shin Gi-Wook eloquently put it, Korean nationalism had always depended on the belief in ethnic homogeneity, but the emphasis on ethnic unity and the concept of nationalism changed at the end of the twentieth century. With Japanese colonization of Korea in the first half of the century, Korean intellectuals came to believe in the biological and cultural unity of Koreans, and they began to see ethnic nationalism as a weapon against imperialism. They tried to prove the distinctiveness of the Korean nation and its capability to confront foreign invasions and in addition modernize Korean society. Korean nationalists such as Shin Chaeho and Choe Nam-seon attempted to use the *Tan'gun* myth to construct a Korean national identity. They argued that *Tan'gun*, the legendary founder of the first Korean kingdom *Kojosŏn* in 2333 BC, was the original ancestor of all Koreans and that he should thus be seen as a historical symbol of cultural and biological unity.[13] After the defeat of the Japanese empire in 1945, the governments of North and South Korea adopted ethnic nationalism as a political ideology that would assist them in nation-building. From the early 1960s to the mid-1980s, South Korea's authoritarian military regimes promoted state-centered nationalism to create unity to oppose external opposition. The South Korean government advocated ethnic nationalism in tandem with anti-communism. For example, the authoritarian president Park Chung-hee declared that an ethnically homogeneous Korean nation rooted in *Tan'gun* had been split into two Koreas as a result of communist "national traitors." According to Park, the existence of North Korea, a satellite state of the Soviet Union, threatened national unity through its introduction of the communist system, which was "alien to the tradition and history of our nation."[14]

The transition toward democracy and continued economic growth in the late 1980s generated a new bottom-up form of ethnic nationalism.[15] With the improvement of South Korea's relations with communist countries, South

13. Gi-Wook Shin, James Freda, and Gihong Yi, "The Politics of Ethnic Nationalism in Divided Korea," *Nations and Nationalism* 5 (1999): 469–72.

14. Ibid., 476–480.

15. Another major incident concerning the rise of popular nationalism in the 1980s was the Gwangju Massacre in the spring of 1980. The Korean people suspected U.S. complicity in the massacre and participated in a new mass anti-American and unification movement (the Mingjung Movement). This "nationalist struggle for independence from foreign intervention and eventual unification" became a prototype of bottom-up ethnic nationalism in post–Cold War Korea. Gi-Wook Shin, *Ethnic Nationalism in Korea: Genealogy, Politics, and Legacy* (Stanford, CA: Stanford University Press, 2006), 168–70.

Korean intellectuals, citizens, and the government began supporting the idea of a peaceful unification with North Korea and emphasized the ethnic unity of the people living in the two Koreas.[16] This conception of ethnically homogeneous Koreans fed expectations for reunification. At the time, most South Koreans agreed that "neither allies nor ideology can surpass the bonds of ethnic unity" as stated in the inaugural address of Korea's first civilian president, Kim Young-sam, in February 1993.[17] During the 1990s, the tide of free trade initiated by the establishment of the World Trade Organization (WTO), and the Korean government becoming a WTO member, intensified and heightened nationalist attitudes. Farmers and nationalist civic groups considered the government's unilateral trade reform of the agriculture sector as the government's submission to the U.S.-led neo-colonial threat. Nationwide protest rallies against the opening of the agriculture market adopted nationalist slogans such as "the second Korean national independence movement" and "Koreans, a rice-consumed ethnic nation, must eat Korean rice."[18]

With economic prosperity in the 1990s, this popular nationalism encouraged Koreans to create and consume nationalist cultural products.[19] Travel books, novels, essays, and movies about finding "Korean-ness" or the "origins of Koreans and their culture" became increasingly popular.[20] Exploring their ethnic roots (*Ppuri ch'atki*) and the Korean diaspora were favored topics in

16. In this period, Korean intellectuals tried to develop a thesis that Korean nationalism based on the belief in ethnic homogeneity contributed to the reunification of Korea. For a critical analysis of the ethnic homogeneity-national unification thesis, see ibid., 185–203.

17. Kim Young-Sam, "Let's Join Forces for New Korea with Hope, Vision," 25 Feb 1993 (Seoul, the Inaugural Address, in Korean).

18. Han Kyung Koo, "Rice and Nationalism?: Beyond the National Borders," *Rice, Life, and Civilization* (in Korean) 1 (2008): 238–49. Following Shin Gi-Wook's work on Korean nationalism, this paper uses the term "ethnic nation" to translate a Korean word *Minjok*. Korean historians have debated on the proper Korean translation of "nation," particularly relating to the term *Minjok*: scholars highlighting the political nature of this term suggest the use of *Kungmin* as a proper Korean translation, while using *Minjok* to mean "ethnic group"; others claim the impossibility of distinction between political and ethnic natures from "nation" in Korea. According to them, the meaning of *Minjok* includes both "nation" and "ethnie." Tae Hoon Lee, "Does 'Minjok' Mean Ethnie?," *Critical Review of History* (in Korean) 98 (2012): 248–68.

19. Here I use the term "popular nationalism" (*Taejung minjokchuŭi*) to highlight its bottom-up character. Benedict Anderson has pointed out that popular nationalism from seemingly spontaneous movements is often carefully crafted by governmental interventions. Kim Soo Ja shows the Korean civilian government's endeavor to curtail popular nationalism in the 1990s. Kim Soo Ja, "Korean Nationalism after Democratization" (ref. 12).

20. Kweon Sug In, "Discourses of Korean Culture in the Age of Consumption and World Systems," *Cross-Cultural Studies* (in Korean) 4 (1998): 181–214.

television documentaries and newspaper articles. Books on the cultural and historical origins of Koreans became bestsellers.[21] "Indigenous" (*T'ojong*) animals and plants became matters for public concern, and traditional foods became trendy.[22]

However, the rise of popular nationalism in the 1990s clashed with social and demographic changes. Under government-led economic liberalization, workers streamed into Korea from developing Asian countries, resulting in rising discrimination against immigrant workers by the government and employers. In 1995, immigrant workers and activists began to protest against such discrimination in the workplace. They formed the Joint Committee for Foreign Workers and demanded the repeal of discriminatory laws. Due to the rise in immigrant activism, non-ethnic Koreans became more visible, and this visibility made Koreans increasingly aware of other ethnic groups. The recognition of migrant citizenship was more than the simple inclusion of immigrants in a polity; it required the reorganization of social boundaries and reflecting on national identities as a whole more critically.[23] With the recognition of cultural heterogeneity, intellectuals became more critical of beliefs in Korean ethnic homogeneity and tried to reveal their socio-political nature. Progressive newspapers and liberal journals also joined the criticism of ethnic nationalism and the dangers it represented in relation to migrant issues.[24] Consequently, tensions increased between proponents of popular ethnic nationalism and those who were skeptical of ethnic homogeneity.

At the turn of the twenty-first century, Korean ethnic homogeneity became a more critical issue. In Northeast Asia, ideological struggles between

21. "The Search for the Archetype of the Korean Ethnic Nation," *Kyŏnghyang Shinmun* (in Korean), 9 Sep 1992.

22. Cho understands that the popularity of "finding Korean-ness" in the 1990s coincided with the rise of a new understanding of traditional culture as a commercial product under Korea's economic liberalization. Hae-Joang Cho, "Constructing and Deconstructing 'Koreanness'," in *Making Majorities: Constructing the Nation in Japan, Korea, China, Malaysia, Fiji, Turkey, and the United States*, ed. Dru C. Gladney (Stanford, CA: Stanford University Press, 1998), 73–91.

23. Hae Yeon Choo, *Decentering Citizenship: Gender, Labor, and Migrant Rights in South Korea* (Stanford, CA: Stanford University Press, 2016).

24. Yoonkyung Lee, "Migration, Migrants, and Contested Ethno-Nationalism in Korea," *Critical Asian Studies* 41 (2009): 363–80. During ex-human rights lawyer Roh Moo-Hyun's administration period, in 2006, the Korean government began to promote multicultural policies aiming to integrate immigrants and biracial people into Korean society. The next conservative administration after Roh's presidency also maintained this multicultural policy due to the need for immigrant workers in the context of the population crisis—a falling birthrate and an aging population.

communist and liberalist countries were replaced by economic and political struggles over territorial boundaries.[25] For example, after the Korean and Chinese governments normalized their diplomatic relations in 1992 and became primary economic partners, they did not intervene or criticize each other's government's ideological differences. Rather, those conflicts concerning security, commerce, and territory increased. A typical case of this was the history war that took place between China and Korea in the early 2000s. The Chinese government launched the Northeast Project of the Chinese Academy of Social Sciences in 2002, which incorporated the ancient kingdoms established in Manchuria and Northern Korea into Chinese national history, even though most Koreans considered them a part of their own history. This project provoked public outrage in Korea and refueled previous territorial and historical disputes. Koguryŏ (37 BC–AD 668), located in what is now Northeast China and two-thirds of the Korean Peninsula, became the main bone of contention. Chinese scholars considered Koguryŏ to be an ethnic Tungusic State and that most of its people were members of Tungusic ethnic groups like the Manchus and Oroqen, now part of China. In contrast, Korean nationalist civic groups, scholars, and the government considered Koguryŏ to be part of Korean history and its population as Koreans, distinct from the ancient Chinese.[26] This controversy was not a simple conflict of historical interpretations but a territorial dispute. In light of North Korea's collapse, it was feared that the inclusion of ancient Koreans into Chinese national history would be used as justification by China in claims of sovereignty over North Korean territories and Chinese Koreans living in Manchuria.[27]

In 2004, outraged Korean citizens and nationalist activists pressed politicians to reprimand the Chinese government. In the same year, the Korean

25. Chun Ja Hyun, "The Historicity of Territorial Disputes in Northeast Asia and the United States: The Rise of China and the Change of the United States," *Korean Journal of Political Science* (in Korean) 22 (2014): 87–108.

26. Jae Ho Chung, "China's 'Soft' Clash with South Korea: The History War and Beyond," *Asian Survey* 49 (2009): 468–83; Peter Hays Gries, "The Koguryo Controversy, National Identity, and Sino-Korean Relations Today," *East Asia* 22 (2005): 3–17.

27. In 1994–1998, a long-term massive famine occurred together with an economic crisis in North Korea partly due to the loss of Soviet support. During the famine and directly after, about 3.5 million people were supposed to have died. Furthermore, the U.S.-led sanctions toward North Korea after the so-called second North Korean nuclear crisis in 2002, led South Koreans to think about the possibility of North Korea's imminent collapse. As an example, see Kim Yeon-Su, "A Study on the Ways for South Korea to Secure Jurisdiction over North Korea in Case of Its Emergency Situation," *New Asia* (in Korean) 13 (2006): 66–96.

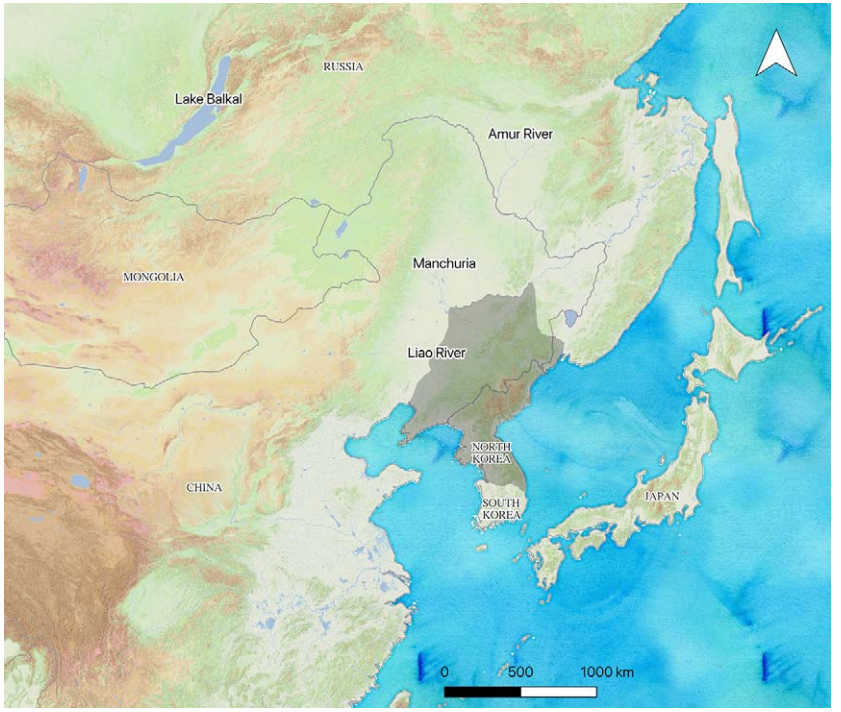

FIG. 1. Korea and neighboring regime (the shaded area is the region of Koguryŏ).

government established the GRF (Goguryeo Research Foundation, later the Northeast Asian History Foundation) to support historical and archaeological research and protect against the "historical distortion" being attempted by the Chinese government and scholars. Koreans expected this systematic and scientific approach to Korean ethnic origins to resolve the controversy by providing "objective" data on Koguryŏ.[28] After two years, the NRICH (Korean National Research Institute of Cultural Heritage Administration) began supporting scientific research on Korean origins to provide "scientific evidence against historical distortion by neighboring countries."[29]

At the time when Korean ethnic homogeneity emerged as a contentious political issue, geneticists outside Korea had already begun to problematize the idea of ethnic homogeneity by employing new genetic technologies. In

28. Jeon Ho-Tae, "Crises and Opportunities from the Outside: Ancient Korean History Scholarship in 2004," *The Korean Historical Review* (in Korean) 187 (2005): 11–28.

29. NRICH, "Announcement: 2006 Conservation Technology Research and Development Project," (NRICH, in Korean, 2005), 31–35.

particular, in collaboration with U.S. geneticists, Japanese geneticists were developing a research method and argument of genetic histories moving against Japanese ethnic homogeneity. The rise of a new global research network of genetic origins led by American and Japanese scientists, together with the domestic socio-political transformation, would push geneticists to rethink Korean ethnic homogeneity.

The Formation of a Transnational Research Network of Genetic Origins

The 1980s saw the beginning of DNA being used specifically to research human origins. Geneticists began to sequence human DNA with the help of restriction fragment length polymorphism (RFLP).[30] In particular, mtDNA, the DNA located in mitochondria, emerged as a promising epistemic object with which to study human evolutionary history. Due to its maternal inheritance, it was simple to analyze and was free of the complexities caused by recombination. Based on the database of mtDNA sequence from diverse human populations, a molecular evolution lab at the University of California–Berkeley, managed by Allan C. Wilson (1934–1991), developed the African Eve theory, which posited that modern humans originated in Africa 100,000 years ago and spread from there to other continents.[31]

Japanese scientists began studying Japanese origins based on mtDNA polymorphism analysis early on, when anthropological genetics in the United States was still in its infancy. From the mid-1980s onward, physical anthropologists in Japan started to question the belief in Japanese ethnic homogeneity, supported by mtDNA technology and a new theory of Japanese origin. At the University of Tokyo, Hanihara Kazuro (1927–2004) criticized the Japanese mono-ethnic myth using archaeological and osteological data. His hypothesis of Japanese origin—which Hanihara himself dubbed the "dual structure model"—was as follows:

> The first occupants of the Japanese Archipelago came from Southeast Asia in the Upper Paleolithic age [the *Jomon* period], the second wave of migration

30. The RFLP technique is used to identify DNA polymorphisms by means of unique patterns of restriction enzyme cutting in specific regions of DNA. Geneticists have used the term "polymorphism" to describe multiple forms of a single gene that exists among individuals, groups, or populations. When it comes to DNA, the polymorphisms become variations in homologous DNA sequences.

31. Marianne Sommer, "History in the Gene: Negotiations Between Molecular and Organismal Anthropology," *Journal of the History of Biology* 41 (2008): 473–528, on 510–11.

> from Northeast Asia took place in the Neolithic age [the *Yayoi* period]. The intermixture of the two populations is currently happening, and the dual structure of the Japanese population is maintained today.[32]

Japanese molecular anthropologists used genetic analysis to confirm this model. Omoto Keiichi (born 1933), also at University of Tokyo, created a modified version of Hanihara's model based on protein polymorphism data collected over the previous three decades.[33] Horai Satoshi (1946–2004) had worked in Omoto's lab at the University of Tokyo and later took a position at the Japanese National Institute of Genetics, continuing mtDNA polymorphism research on the Japanese population from 1983 to 1993. Horai found dual clusters in the Japanese mtDNA database and argued that his genetic origin study refuted the idea of ethnic homogeneity. According to him, the modern Japanese population had resulted from the admixture of two gene pools, the Jomon population arriving from Southeast Asia 12,000 years ago and the Yayoi population that migrated from the Korea peninsula 2,300 years ago.[34] Horai's group also carried out a collaborative mtDNA research on the genetic origin of Native Americans, with Wilson's promising protégé Mark Stoneking (born 1956).[35]

In the early 1990s, the transnational research network on human evolution began to expand beyond American-Japanese collaboration. In close partnership with American pioneers in this field, Horai's group found "Asian-specific" mtDNA markers based on their Japanese mtDNA polymorphism data. He also collaborated with Y-DNA researchers. The non-recombining portions of Y-chromosomal DNA were another research object for human evolution as supplemental to mtDNA analysis due to the portions' paternal inheritance and non-recombination properties.[36] The YCC (Y Chromosome Consortium)—which began with Wilson's former doctoral student Michael Hammer (earned Ph.D. in 1984) at the University of Arizona in 1994 and consisted of American, Australian, British, and Japanese population geneticists—was a platform for

32. Hanihara developed this theory from 1984 to 1991. For the history of the development of Hanihara's model in Japan after World War II, see Arnaud Nanta, "Physical Anthropology and the Reconstruction of Japanese Identity in Postcolonial Japan," *Social Science Japan Journal* 11 (2008): 29–47.

33. Keiichi Omoto and Naruya Saitou, "Genetic Origins of the Japanese: A Partial Support for the Dual Structure Hypothesis," *American Journal of Physical Anthropology* 102 (1997): 437–46.

34. Horai Satoshi, *DNA Human Evolution Research* (Iwanami Shoten, in Japanese, 1997).

35. Ibid., 46–61 and 106–109.

36. Luigi Luca Cavalli-Sforza's group at Stanford, a competitor of Wilson's team at Berkeley, pursued finding Y-DNA markers during the 1990s.

Y-DNA researchers.[37] Members of the YCC were committed to identifying Y-chromosomal polymorphisms and the construction of evolutionary trees of Y-DNA haplotypes and haplogroups.[38] Since Y-DNA researchers had trouble sampling indigenous people worldwide, they tried to solve this problem by sharing samples with other researchers and establishing common tissue banks. In this process, they developed the practice of the free exchange of research materials and results, as the *Drosophila* geneticists' community had done in the United States a century prior.[39] Through the YCC's network, Horai's group collaborated with Hammer's molecular evolution laboratory at the University of Arizona, to find Y-DNA markers to study Japanese genetic origin.[40]

Their transnational network was beyond the reach of traditional international collaboration in human evolution. Although geneticists in advanced liberal countries remained instrumental in the formation of collaborative research networks, researchers in developing countries, particularly former communist countries in Asia, were informally included. They were not official members of the YCC but shared their populations' DNA samples with the YCC members and obtained informal assistance from the YCC in their local genetic research projects.[41] Population geneticists in Korea also benefitted from such expanding inclusive scientific collaboration. Coincidentally, with Korean ethnic homogeneity looming large in Korean society, it would be this newly emerged transnational scientific network of human evolution that

37. It aimed to set up a database of genotypes on DNAs at Y-specific loci, establish lymphoblastoid cell lines at the Laboratory of Human Genetics of the New York Blood Center, and provide the laboratories searching for polymorphisms with DNA that the University of Arizona would extract from the cell lines expanded in New York. Sommer, *History Within* (ref. 8), 302–30. For the member list of the YCC, see Michael F. Hammer and Nathan A. Ellis, "YCC Newsletter" (YCC, 1994).

38. A haplotype is used to indicate a specific DNA sequences in a cluster of genes that are inherited together, and a haplogroup is used to indicate a group of similar haplotypes with a common ancestor. The YCC took a role in the development of Y-DNA haplogroups nomenclature.

39. Robert E. Kohler, *Lords of the Fly: Drosophila Genetics and the Experimental Life* (Chicago: University of Chicago Press, 1994).

40. Michael F. Hammer and Satoshi Horai, "Y Chromosomal DNA Variation and the Peopling of Japan," *American Journal of Human Genetics* 56 (1995): 951–62.

41. For instance, for their Mongolian Y Chromosomes project, Chris Tyler-Smith's team collaborated with Bumbein Dashnyam at the Mongolian Academy of Sciences, Mongolia. Michael Hammer's group also developed a close tie with Tatyana Karafet at the Institute of Cytology and Genetics, Novosibirsk, Russia, to study Y chromosome polymorphisms in native populations of Siberia. Karafet later moved to Hammer's lab. Hammer and Ellis, "YCC" (ref. 37).

would enable Korean geneticists to study the DNA of the Korean population from a new perspective.

LOCALIZING TRANSNATIONAL GENETICS: KIM WOOK'S DUAL-ORIGINS HYPOTHESIS

Questioning Korean Ethnic Homogeneity

Before the 1990s, Korean geneticists had researched the Korean population under the assumption of ethnic homogeneity. Let us consider the example of two leading Korean population geneticists, Lee Chung Choo (born 1935) at Seoul National University and Kim Yung Jin (1932–2006) at Chungnam National University. Kim had first become interested in scientifically demonstrating the ethnic homogeneity of Koreans in the late 1970s.[42] Lee's lab at Seoul National University had studied polymorphic serum proteins in the Korean population from the late 1970s; Kim had been trained in enzyme polymorphism analysis for identifying genetic variation in amphibians and reptiles using starch gel electrophoresis. Closely cooperating with Lee and his protégés, Kim applied protein polymorphism research conducted on isozymes and plasma proteins to examine the Korean genetic structure.[43] After Kim became a professor in 1984, Kim and Lee launched a long-term research project titled "Molecular Genetic Studies of the Korean Population." This project tried to identify genetic differences and similarities between Koreans and other populations, assuming that "the Korean population has a unique genetic structure."[44] Kim Yung Jin maintained that "our nation is ethnically homogeneous with a long history of over four thousand years."[45] Other human biologists in Korea also shared this idea about Koreans, and in 1981, physical anthropologist Na Sechin argued that despite invasions from Japan and China, "due to the prohibition of exogamy and a long history of exclusionism,

42. "The Genetic Structure of Koreans is Uniform (*korŭda*)," *Kyŏnghyang Shinmun* (in Korean), 10 Jul 1978.

43. Ahn Gwang Sook, interview by author, Daejeon, Korea, 23 Feb 2017.

44. Jong Soon Kim, Yung Jin Kim, and Suh Yung Yang, "Molecular Genetic Studies of Korean Population: I. Genetic Structure and Gene Frequencies of Oxidoreductase," *The Korean Journal of Genetics* 7 (1985): 143–51.

45. Jong Soon Kim and Yung Jin Kim, "Molecular Genetic Studies of Korean Population: I. Genetic Structure and Gene Frequencies of Oxidoreductase," *The Korean Journal of Genetics* (in Korean) 6 (1984): 152–53.

Koreans have consisted of an isolated gene pool."[46] Although by the 1980s the population of South Korea exceeded 40,000,000, Korean human biologists continued to believe that Koreans had a reproductively isolated gene pool due to their endogamous practices.[47]

In the 1990s, a young generation of population geneticists explored the genetic characteristics of the Korean population in different ways. Hong Sung Soo at Seoul National University was the first to introduce mtDNA sequencing to research into Korean genetic variation. In his dissertation, published in 1993, Hong questioned the ethnic homogeneity of modern Koreans because of "the history of Korea occupied by many invaders [from China and Japan]."[48] In his dissertation on Y-DNA polymorphism research in 1995, Park Hwayong, a doctoral student at Chungnam National University, also raised doubts about Korean ethnic homogeneity because "due to the geographical location, [Korea] has been invaded more than 600 times by its neighboring countries."[49] Both young scholars challenged the complete lack of exogamy in light of "frequent invasions" and considered the reasonable possibility of influx from "different populations into the Korean gene pool."[50]

As a consequence of the rising interest in ethnic homogeneity and the increased presence of migrant workers in the mid-1990s, young geneticists also began to consider such a possibility. Park Hwayong recollected, "Although all Koreans were eager to believe in Korean ethnic homogeneity and find relevant evidence [at the time], they might have implicitly felt it was impossible. As we

46. Na Sechin and Chang Sinyo, *Physical Anthropological Studies of the Korean* (Seoul: Chungangilbosa, in Korean, 1981).

47. As an example, see Yong Kyun Paik, "Population Genetic and Ecogenetic Studies in Korea," *The Korean Journal of Genetics* 8 (1986): 230–32. For an episode of population geneticists and physical anthropologists trying to define an ethnic group based on "endogamy" in the 1960s and the 1970s, see Veronika Lipphardt, "'Geographical Distribution Patterns of Various Genes': Genetic Studies of Human Variation after 1945," *Studies in History and Philosophy of Science, Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 47 (2014): 50–61.

48. Hong Sung Soo, "The Characteristics of Korean Population Using the Genetic Markers of Mitochondrial and Nuclear DNA," (PhD dissertation, Seoul National University, 1993), 34.

49. Park Hwayong, "Genetic Polymorphism of Y-DNA Haplotypes in Korean Population," (PhD dissertation, in Korean, Chungnam National University, 1995), 35; Kim Yung Jin, "A Report on the Research Outcome in 1995 KOSEF Research Project: Surnames of Koreans and Y-DNA Haplotype," (Daejon: KOSEF, 1996), 2. Park Hwayong stated that he had written this proposal and not his supervising professor Kim Yung Jin. Park Hwayong, interview by author, Daejon, Korea, 30 Jun 2017.

50. Hong Sung Soo, interview by author, Seoul, Korea, 4 Jul 2017; Park, "Genetic Polymorphism" (ref. 49).

have seen the effect of globalization in the last several decades, it was evident that the influx of different populations into the Korean peninsula in the past had impacted the Korean gene pool."[51] Immigration to Korea as a result of globalization influenced Park's reconsideration of "frequent invasions from neighboring countries" as "the mass immigration in the past" and as "the influx of heterogeneous genes into the Korean gene pool."[52]

At the same time, a new connection with Japanese molecular anthropologists became an essential source of inspiration. In 1991, Horai Satoshi was invited to present the results of his mtDNA analysis at the 14th Annual Meeting of the Korean Society for Genetics held in Korea: the Japanese had two origins. In this talk, Horai explained that he needed data on the South Korean structure to be able to confirm his models.[53] Among some young Korean scholars enrolled in this program and one of the first to do so was Hong Sung Soo. It was at Horai's lab that he learned mtDNA sequencing techniques, and it was in collaboration with him that Hong researched Korean origins further.[54] In 1998, cooperating with Horai, Hong re-analyzed the database on mtDNA polymorphism of Koreans that he had compiled for his dissertation. He accepted Horai's hypothesis of the 9-bp deletion polymorphism of mtDNA originating from an area in Southeast Asia similar to Polynesia and Melanesia, with southern populations migrating to the northern region of Asia. They supposed that the 13 percent rate of the 9-bp deletion in the Korean population indicated a possible influence of Southeast Asian groups on the Korean gene pool.[55] For him, proving a plurality of origin for the Korean population in turn indicated their ethnic heterogeneity.[56]

51. Park, "Genetic Polymorphism" (ref. 49).

52. Hong, interview 4 Jul (ref. 50); Park, interview 30 Jun (ref. 49).

53. Hong, interview 4 Jul (ref. 50).

54. Ibid.

55. Sung-Soo Hong, Satoshi Horai, and Chung-Choo Lee, "Distribution of the 9-bp Deletion in COII/tRNALys Intergenic Region of Mitochondrial DNA is Relatively Homogeneous in East Asian Populations," *Korean Journal of Biological Sciences* 2 (1998): 259–67. The 9-bp deletion is the mutation caused by the loss of one copy of the 9-bp tandem repeat sequence in the intergenic region between cytochrome c oxidase II (COII) and mitochondrial TK2 thymidine kinase 2 (MTTK). From its early discovery, geneticists had identified this polymorphism as an "Asian-specific" mutation because it was very common among populations of Asian ancestry. Horai was one of those geneticists who considered the 9-bp deletion an ethnic-specific polymorphism and developed the migration hypothesis based on the frequency of the polymorphism among Asian groups.

56. "Fifteen Percent in Korean Genes is the Southern Lineage," *Donga Science* (in Korean), 16 May 2001.

Park Hwayong followed Hong's path. He applied the DNA sequencing technique and the new perspectives on the origins of Koreans, learned from Hong's work at Seoul National University, to his Y-DNA analysis. Park also questioned Korean ethnic homogeneity by revealing the diverse origins of the Korean population. However, unlike Hong, Park considered Y-DNA a more promising object than mtDNA to identify the genetic effect by the influx of neighboring people to Korea through invasions, because a Y-DNA marker could reveal the trace of ancient troops outside of Korea due to its paternal inheritance. Later he joined Michael Hammer's team at the University of Arizona for his postdoctoral work as a Y-DNA researcher, referencing Hammer and Horai's collaborative research.[57]

In summary, when Korean ethnic homogeneity emerged as a critical issue in Korean society, young Korean geneticists began genetic history studies on Koreans to examine ethnic homogeneity under the influence of Japanese molecular anthropology. As we shall see, Kim Wook, the leading scholar in genetic history studies in Korea, would also start to question Korean ethnic homogeneity in a similar way to other young geneticists. Furthermore, changing political and scientific contexts after 2000 offered an unprecedented opportunity to research Korean genetic origins. Kim Wook's work on the dual-origins hypothesis drew support not only from the expanding transnational research network of genetic origins but also from rising concerns about these origins in the context of nationalist politics between Korea and China and changes in Korean society, which was becoming increasingly multicultural.

Kim Wook's Dual-Origins Hypothesis

Kim Wook discovered genetic origin research when he began his career as a new professor at Dankook University, Cheonan.[58] He had been trained in the population genetics of *Drosophila* in the Department of Biology at Sungkyunkwan University, and his postdoctoral research was on *Drosophila* genetics under the supervision of Margaret Kidwell at University of Arizona in 1992–1993.[59] There, Kim Wook met Michael Hammer, cofounder of the YCC. In

57. Park, interview 30 Jun (ref. 49).

58. For Kim Wook's academic profile and works, see *Commemoration Papers for Kim Wook's Retirement* (Cheonan: Genetics Laboratory, Department of Biological Sciences, Dankook University, in Korean, 2018).

59. Jin Han-Jun, interview by author, Cheonan, Korea, 14 Feb 2017; Kim Wook, interview by author, Cheonan, Korea, 13 Aug 2018.

the same period, with Horai's group, Hammer studied the frequency of the Y Alu polymorphic (YAP) element among human populations. Hammer-Horai's collaborative research team used this genetic marker to study the peopling of Japan. However, they needed Korean data since the Korean peninsula was supposed to have been the main route taken by the Japanese ancestor group, the Yayoi population. Kim Wook helped with Hammer's study by providing Korean blood and buccal epithelial cell samples.[60] Hammer suggested Kim Wook survey the frequency of the YAP element in Koreans as a part of this Japanese origin research.[61] After returning to Korea, inspired by Hammer and Horai, Kim Wook started to conduct genetic origin research on the Korean population.[62] He joined Kim Yung Jin's research team and began to study Korean genetic origins using Y-DNA analysis.[63] At the time, like other young Korean geneticists, Kim Wook also accepted Horai's admixture thesis over the single-origin thesis of the modern Japanese and applied this to the genetic origin studies of Koreans.[64] In the winter of 1996, Kim Yung Jin and Kim Wook's team submitted an English research report to KOSEF questioning the single origin of the Korean population:

> It has been believed that the Korean people are a single race originating from a single ancestor *Tankoon* [*Tan'gun*], who founded the first nation in Korea 50 centuries ago. However, this mythology-based statement has never been examined from scientific or genetic points of view.[65]

To examine the idea of a single origin, they conducted Y-chromosomal haplotype analysis among different surname groups. The samples were classified into six genetic groups, from which they inferred that Koreans "may not be a single race or the descendants of a single ancestor *Tankoon*

60. Hammer and Horai, "Y Chromosomal DNA Variation" (ref. 40), 952.

61. Kim, interview 13 Aug (ref. 59).

62. Ibid.

63. In 1995, after Park Hwayong persuaded his advisor Kim Yung Jin to consider Y-DNA polymorphism analysis as a way to find the possibility of the influx from different populations to Korea by invasions, they began studying Korean ethnic homogeneity based on Y-DNA polymorphism analysis. Their research proposal was accepted by KOSEF (Korean Science and Engineering Foundation), a major governmental research-funding agency. In the spring of the next year, however, Park withdrew from the project to work as a postdoctoral researcher in Michael Hammer's molecular evolution laboratory at the University of Arizona. In place of Park, Kim Yung Jin collaborated with Kim Wook to finish this project. Paik Sang Gi, interview by author, Daejon, Korea, 23 Feb 2017.

64. Kim, interview 13 Aug (ref. 59).

65. The word "race" is original. Kim Yung Jin, "A Report" (ref. 49).

[*Tan'gun*]."[66] At this point, geneticists and historians seemed to have the same focus—revealing the ancient history of Korea. However, geneticists decided to proceed independently from professional historians and used sources whose reliability was questionable from a historical perspective. For instance, they used non-academic Korean literature such as the *Memorabilia of the Three Kingdoms* to corroborate their historical narrative of Koreans. The only academic literature that they used was *A History of Korean People*, written by nationalist historian Son Chin-t'ae in 1948, but which was evidently a text that historians had already considered outdated by the late 1990s.[67]

In contrast to the lack of interdisciplinary collaboration with academic historians, international collaboration with geneticists outside of Korea was actively promoted. Hammer encouraged Kim Wook's group to study Korean Y-DNA polymorphisms as a part of Japanese genetic origin studies while introducing his YCC connections to the Korean geneticists.[68] Kim Wook hoped to use Korean data to confirm the Hammer-Horai team's Japanese dual-structure model and later reported that their analysis on Koreans supported "the migration of the Yayoi population from Korea to Japan."[69] Besides, although Kim Wook did not join the YCC, with Hammer's help his group was able to form academic ties with the YCC researchers. The YCC's custom of transnational free exchange helped Korean geneticists collect research materials and find collaborators, which according to Kim Wook, played a vital role in the initiation of genetic origin research on Koreans.[70] Harihara Shinji at the University of Tokyo (Omoto Keiichi's lab) and Chris Tyler-Smith (earned Ph.D. in 1980) at the University of Oxford (later the Wellcome Trust Sanger Institute, U.K.) helped Kim Wook's group obtain Asian male DNA samples to research Korean genetic origins.[71] Furthermore,

66. Kim Yung Jin, "A Report" (ref. 49). They later published this result in 1999. Young Jin Kim, Sang Gi Paik, Gwang Suk Ahn, and Kim Wook, "49a/TaqI Haplotypes According to the Surname Groups in Korean Population," *Korean Journal of Genetics* 21 (1999): 181–92.

67. Young Jin Kim et al., "49a/TaqI Haplotypes" (ref. 66), 189–90. For the cooperation problem of geneticists and historians in genetic history studies, see Egorova, "DNA Evidence" (ref. 4).

68. "Report from Michael Hammer and Collaborators," in Hammer and Ellis, "YCC" (ref. 37).

69. Wook Kim, Dong Jik Shin, Sun Ah You, and Yung Jin Kim, "Y-specific DNA Polymorphisms of the YAP Element and the Locus DYS19 in the Korean Population," *Journal of Human Genetics* 43 (1998): 195–98; Kim, interview 13 Aug (ref. 59).

70. Kim, interview 13 Aug (ref. 59).

71. Dong Jik Shin, Yung Jin Kim, and Wook Kim, "PCR-based Polymorphic Analysis for the Y Chromosomal Loci DYS19 and DXYS5Y (47z) in the Korean Population," *Korean Journal of*

by sharing samples, Kim Wook's group formed long-term collaborative relationships with Chris Tyler-Smith's lab.[72]

In the first decade of the twenty-first century, Korea's socio-political climate became favorable to Kim Wook's genetic origin research. Disputes with China on the history of Koguryŏ had provoked a nationalist backlash. The newly established GRF and the NRICH supported Kim Wook's genetic origin research on Koreans as a way of collecting scientific evidence against China's "historical distortion" of ancient Korean history.[73] The multiethnic situation in Korea would also be advantageous to his lab. When the NFS (Korean National Forensic Service) first established a Korean genetic database for forensic DNA fingerprinting in the late 1990s, NFS officials became concerned about the potential effects of the multiethnic situation on forensic profiling. In this context, they sought to create a DNA database as a first step toward further ethnicity-specific DNA fingerprinting.[74] Thus, the NFS cooperated with population geneticists and supported their research on Koreans. As a result, the NFS has been a significant source of funding for Kim Wook's lab since 1999.[75]

It was immigrant workers in Korea who made it possible for Kim Wook's team to identify "Korean-specific" genetic markers. In 1998 and 1999, Kim Wook's group became interested in the relation between Koreans and Southeast Asians when looking at Y-DNA analysis. They collected blood samples from foreign workers in Korea, and a year later they were able to obtain samples of Northern Asian DNA without having to travel to do so; they collected blood samples from Northern Chinese, Manchurian, and Miao workers living near Dankook University. The easing of travel restrictions to formerly communist countries also facilitated the collection of further Asian DNA samples, and in

Biological Sciences 2 (1998): 283; Shin Dong Jik, "Genetic Structure of the Korean Population Based on the Y Chromosomal DNA Variation," (PhD dissertation, in Korean, Dankook University, 2000), 23; Han-Jun Jin et al., "The Dual-Origins" (ref. 11), 34.

72. Tyler-Smith originally started his Y-DNA variation research using blood samples from Mongolian males and was interested in the migration of Mongolians in the early 1990s. He thus became interested in the genetic history of Koreans in relation to Mongolians. Chris Tyler-Smith, "Report from Chris Tyler-Smith and collaborators," in Hammer and Ellis, "YCC" (ref. 37). Kim, interview 13 Aug (ref. 59).

73. Kim Wook and Kim Chong-Youl, *Koguryeo Research Foundation Report 13: Modern Korean Origin and the Peopling of Korea as Revealed by mtDNA Lineages* (Seoul: Koguryeo Research Foundation, in Korean, 2005).

74. Jin, interview 14 Feb (ref. 59).

75. Kim, interview 13 Aug (ref. 59); Jin, interview 14 Feb (ref. 59).

2004, Kim Wook's group went to Vietnam and Mongolia to collect samples.[76] His lab was the first in Korea to collect non-Korean samples for use in genetic research on the Korean population.

Using Southeast Asian immigrants' DNA samples and the NFS's financial support, in 1999, Kim Wook's team first obtained a result of dual patterns in Koreans using Y-DNA haplotype analysis.[77] A year later, Kim Wook's group collaborated with the Japanese team at the University of Tokyo and proposed a speculative explanation of the possibility of Korean dual origins, just as had already been demonstrated in the Japanese population.[78] In 2003, Kim Wook's group named their idea the dual-origins hypothesis. They collaborated with Japanese and Chinese research groups as well as with Chris Tyler-Smith and Michael Hammer. According to the main scientist, Jin Han-Jun, Korean geneticists collected samples and genotyped DNA samples. Tyler-Smith and Hammer collected additional samples and helped with data analysis, while the Japanese and Chinese groups provided samples of their respective populations.[79] They examined the distribution of Y-DNA haplogroups in males from different East-Asian ethnic groups, and concluded that "Koreans appear to be most closely related overall to the Manchurians among East-Asian ethnic groups, although they also cluster with populations from Yunnan and Vietnam [in Southeast Asia]." They thus proposed, "The peopling of Korea can be seen as a complex process with an initial Northern Asian settlement followed by several migrations, mostly from Southern to Northern China," at least concerning paternal origins.[80]

When Kim Wook's team pushed Y-DNA research on the Korean population, Kim Jung-bae, a prominent ancient historian and Chairman of the GRF, contacted him. President Kim requested genetic analysis using the GRF's funding resources to resolve the dispute on the history of Koguryŏ.[81] Backed

76. Kyoung Don Kwak, Han Jun Jin, Dong Jik Shin, Jung Min Kim, Lutz Roewer, Michael Krawczak, Chris Tyler-Smith, and Wook Kim, "Y-Chromosomal STR Haplotypes and Their Applications to Forensic and Population Studies in East Asia," *International Journal of Legal Medicine* 119 (2005): 195–201.

77. Shin Dong Jik, "Y Chromosomal DNA Variation" (ref. 71), 196–98.

78. Wook Kim, Dong Jik Shin, Shinji Harihara, and Yung Jin Kim, "Y-chromosomal DNA Variation in East Asian Populations and Its Potential for Inferring the Peopling of Korea," *Journal of Human Genetics* 45 (2000): 76–83.

79. Jin, interview 14 Feb (ref. 59). Kim Wook similarly recollected that Tyler-Smith and Hammer's teams offered program algorithms to analyze DNA data as well as non-Korean samples. Kim, interview 13 Aug (ref. 59).

80. Han-Jun Jin et al., "The Dual-Origins" (ref. 11), 34.

81. Kim, interview 13 Aug (ref. 59).

by the GRF, Kim Wook's collaborative team, with Tyler-Smith and Hammer's groups, extended their research to include mtDNA polymorphism analysis. As a result, they identified the dual patterns in the maternal origins of Koreans through mtDNA analysis in 2005.[82] They reported that about 60 percent of Koreans had mtDNA haplogroups that were prevalent in North Asians, and about 40 percent had haplogroups that were predominant in Southeast Asians.[83] Although they discovered the same dual clusters in both Y-DNA and mtDNA polymorphism studies, the migration of and the relationship between Northern and Southern populations remained unknown. It was expected that comprehensive research on Korean origins using both Y-DNA and mtDNA analysis would clarify the admixing process of two ancestor populations.

In 2009, Kim and Tyler-Smith's team published comprehensive research on the genetic origins of Koreans based on mtDNA and Y-chromosomal markers.[84] By considering both paternal and maternal inheritance, they revealed a "sex-biased admixture" of Korean origins: "by the admixture estimates, a 35% contribution from the south was estimated for mtDNA, compared with an 83% contribution for the Y chromosome." Following Hammer-Horai's collaborative Y-chromosomal research on "dual origins of the Japanese," they interpreted this result as "an early Northern Asian settlement with at least one subsequent male-biased Southern-to-Northern migration, possibly associated with the spread of rice agriculture."[85] This dual-origins hypothesis was the culmination of a decade-long study funded by law enforcement agencies and nationalist research institutions, in addition to transnational cooperation with Japanese, U.S., and U.K. scientists, and one that benefitted in multiple ways from Korea's multiethnic population.

This genetic origin research made Kim Wook an authority on the genetic history of South Korea. Although his lab at Dankook University was much smaller than those at other leading genomic institutions in Seoul, their work on the dual-origins hypothesis became the basis for studying genetic ancestry in several Korean genome projects.[86] But it is important to note that this

82. Ibid.

83. Kim Wook, "mtDNA Variation and Its Implications for the Origins of Koreans," in Kim Wook and Kim Chong-Youl, *Modern Korean Origin* (ref. 73), 48–49, and 103.

84. Kim, interview 13 Aug (ref. 59).

85. Han-Jun Jin, Chris Tyler-Smith, and Wook Kim, "The Peopling of Korea Revealed by Analyses of Mitochondrial DNA and Y-Chromosomal Markers," *PloS One* 4 (2009): e4210.

86. For example, one of the first Korean genome sequence research used Kim Wook's genetic origin studies when analyzing genetic ancestry of the genomic data. Sung-Min Ahn, Tae-Hyung

work also gained international recognition. Kim's results were used as a substantial source by Mark Stoneking and Frederick Delfin at the Max Planck Institute for Evolutionary Anthropology in writing the genetic history of East Asians.[87]

Meanwhile, the dual-origins hypothesis had two conflicting motivations. Along with transnational genetic research on the peopling of Japan questioning the fallacy of Japanese ethnic homogeneity, Kim Wook's group developed a hypothesis to challenge the belief in Korean ethnic homogeneity. At the same time, the GRF funded research into Kim Wook's research in order to use the genetic database "as scientific evidence against historical distortions by neighboring countries."[88] This put scientists in the complicated position of being under pressure from those financing their research to write Korean genetic history in such a way that it defended the nationalist position that ethnic homogeneity had been preserved since antiquity.

Kim Wook devised two rationales for resolving the tension between the two inherent conflicts in the dual-origins hypothesis. The hypothesis only problematized the belief of "single-origin" Koreans and did not threaten other parts of the belief in Korean ethnic homogeneity. Whether or not today's Korean population is ethnically homogeneous is difficult to answer with genetic origin studies alone. A specific population's genetic homogeneity today is not incompatible with the population having diverse origins in the past. Thus, it is plausible that this specific population has "historically" diverse origins but shows ethnic homogeneity "in the current period."[89] In other words, the genetic history of Koreans only proved that "modern Koreans are not a single-origin ethnic nation (*Tanil giwŏn minjok*)" and cannot give any clear answer as to whether "modern Koreans are an ethnically homogenous nation (*Tanil minjok*)." Using this point, Kim Wook's group was able to offer the Foundation the conclusion they were expecting in a 2006 research report from the GRF. He concluded that although the ancestral groups of Koreans in the

Kim, Sunghoon Lee, Deokhoon Kim, Ho Ghang, Dae-Soo Kim, Byoung-Chul Kim, Sang-Yoon Kim, Woo-Yeon Kim, Chulhong Kim, Daeui Park, Yong Seok Lee, Sangsoo Kim, Rohit Reja, Sungwoong Jho, Chang Geun Kim, Ji-Young Cha, Kyung-Hee Kim, Bonghee Lee, Jong Bhak, and Seong-Jin Kim, "The First Korean Genome Sequence and Analysis: Full Genome Sequencing for a Socio-Ethnic Group," *Genome Research* 19 (2009): 1622–29.

87. Mark Stoneking and Frederick Delfin, "The Human Genetic History of East Asia: Weaving a Complex Tapestry," *Current Biology* 20 (2010): 188–93.

88. Kim Wook and Kim Chong-Youl, *Modern Korean Origin* (ref. 73); Kim, interview 13 Aug (ref. 59).

89. Kim, interview 13 Aug (ref. 59).

prehistoric period consisted of two populations from North and Southeast Asia, "Koreans have formed relatively high genetic homogeneity that is different from the Chinese."[90]

Kim Wook's other rationale was to emphasize the cultural and linguistic characteristics of the Korean ethnic nation. He defined an ethnic nation (*Minjok*) as "people using the same language and sharing the same culture and history." Although two different groups migrated from Northeast and Southeast Asia to the Korean peninsula, by living together over the generations and using the same language, they became a distinct ethnic nation—modern Koreans—different from the modern Chinese and Japanese. According to this logic, modern Koreans' genetic homogeneity was not the result of a single origin, but of a historical process, which over time resulted in the formation of their cultural and linguistic homogeneity.[91]

By making the distinction between *Tanil giwŏn minjok* and *Tanil minjok* and defining a genetic homogeneity as a result of cultural homogeneity, Kim Wook's team was able to localize transnational genetic origin research to meet local political demands. These rationales were essential in allowing the wide circulation of the dual-origins hypothesis as well as making them available to different political actors to enable the mobilization of genetic knowledge.

PUBLIC RECEPTION AND USES: A SCIENTIFIC REFUTATION OR ENDORSEMENT OF KOREAN ETHNIC HOMOGENEITY

The dual-origins hypothesis came to the public eye in 2006. This genetic knowledge seemed to solve the controversy revolving around Korean ethnic homogeneity, which was still a critical issue in the late 2000s. Kim Wook defined neutrally mutated portions of DNA sequences as "neutral fossils" into which the migration history of the Korean population was carved.[92] Just as the Chairman of the GRF was charmed by its scientific objectivity, those struggling with redefining or defending traditional national boundaries also found a solid base for their claims rooted in genetic knowledge.

90. Kim Wook, "mtDNA Variation" (ref. 83), 47 and 49; "Professor Kim Wook Has Been Given a Public Attention by His Research on Korean Origins," *Chugan Chosŏn* (in Korean), 13 Oct 2007.

91. Kim, interview 13 Aug (ref. 59); Kim Wook, "mtDNA Variation" (ref. 83), 121.

92. Kim, interview 13 Aug (ref. 59).

On the one side, the genetic origin studies were portrayed in the Korean mass media as being a "scientific refutation" of the misconception about Korean ethnic homogeneity. In 2006, the year when the Korean government officially initiated its multicultural policy, of Kim Wook's work it was reported that "Koreans are an admixture between the Northern and Southeastern Asians regarding genetics; they are not ethnically homogeneous."[93] In 2009, the *Weekly Chosun*, a popular news magazine in Korea, introduced the dual-origins hypothesis as a scientific refutation of Korean ethnic homogeneity.[94] In fact, Kim Wook himself galvanized public attention on the political importance of the hypothesis by taking this "scientific refutation" position. In 2010, he joined an immigration policy forum titled "Korea is an ethnically homogeneous nation? Its Reality Examined from an Academic Perspective," hosted by members of the Korean National Assembly.[95] In this forum, Kim Wook urged that Koreans were not a "single-origin" people—without any mention about genetic homogeneity—and that they had to accept migrations from Southeast Asia. Kim claimed that multicultural policy helped to increase Koreans' genetic diversity and thus make their genetic pool healthier. His argument in favor of pro-immigrant policy was more or less eugenic and assimilationist because he suggested that, "multicultural people [immigrants from Southeast Asia] who are genetically healthy and willingly learn Korean language and culture should be more considered than others who are not."[96]

Immigrant activists and scholars in the field of multicultural policy welcomed and cited this genetic research as revealing that Korean ethnic homogeneity was a myth. Pastor Kim Haesŏng, a so-called father of immigrant workers, claimed, "From a scientific perspective, Korean people are ethnically heterogeneous [*Pok'am Minjok*] and a mix of Northern lineage (60%) and Southeastern lineage (40%)."[97] He argued, "We have to recognize the [nature

93. "Is the Korean People an Ethnically Homogenous Nation? Nothing of That Kind," *Chugan Donga* (in Korean), 8 Mar 2006; The Seoul Broadcasting System (SBS), "The Country for an Ethnically Homogenous Nation, Your Korea," (Seoul: SBS Special, in Korean, 6 Nov 2006).

94. "The Korean People is not an Ethnically Homogenous Nation!" *Chugan Chosŏn* (in Korean), 9 Jan 2009.

95. "Korea is an Ethnically Homogeneous Nation? Its Reality Examined from an Academic Perspective," *The Korean Parliamentary League on Children, Population, and Environment*, 23 Jun 2010.

96. Kim, interview 13 Aug (ref. 59).

97. "The Life of Pastor Kim Haesŏng, Called the Father of Immigrant Workers," *Han'gyŏre* (in Korean), 15 Oct 2010.

of our] multi-racial, multi-ethnic society while giving up the belief of an ethnically homogeneous nation."[98] Kim Bum-soo, a scholar in multicultural policy, denounced the belief in ethnic homogeneity and racial discrimination against non-ethnic Koreans because "genetic science shows that the Northern and Southeastern lineages, as well as the original people, are mixed in Korean blood."[99] Even evolutionary biologist Choe Jae Chun claimed that Korean ethnic homogeneity was a myth because genetic research revealed that Koreans consisted of Northern and Southern lineages. Choe also suggested promoting active immigrant policy based on the presupposition of Koreans as an ethnically heterogeneous people.[100]

On the other side, non-academic historians and anti-multiculturalists used Kim Wook's research to buttress their belief in Korean ethnic homogeneity.[101] Indeed, the dual-origin hypothesis shared its historical narrative with nationalist historiography because Kim Wook's group cited the narrative from the nationalist literature on Korean archaeology and history as a part of their research. As Soraya de Chadarevian notes, genetic data alone are insufficient to determine an ethnic group's population history or genetic history. To interpret genetic data and create historical details, population geneticists have to rely on historical narratives and records.[102] Kim Wook's team must also have used the historical and archaeological literature to interpret their genetic data. However, they treated historical facts as if they were transparent and fixed chronological indicators that might help them decide an estimated divergence time of Y-DNA or mtDNA haplogroups.[103] As a result, they did not consider

98. Kim Haesŏng, "'An Ethnically Homogeneous Nation' and 'the Multicultural Society'," Korea Support Center for Foreign Workers (in Korean); http://www.migrantok.org/korean/viewtopic.php?t=1575i (accessed 19 May 2017).

99. Kim Bum-soo, "Backgrounds of the Multicultural Society in Our Country and Policy Problems for Married Immigrant Women," *The Journal of Research for Palgŭn Society* (in Korean) 29 (2008): 63–113.

100. Choe Jae Chun, *Double Cropping of Your Life: A Biologist's Perspective on a Hyper-aged Society in 2020* (Seoul: Samsung Economic Research Institute, in Korean, 2005), 122–30.

101. "Non-academic historian" is a transliteration of *Chaeya sahakcha*, one who is outside of academia and objects to the view of academic history (*Kangdan sahak*) regarding the *Tan'gun* myth. Non-academic historians have claimed *Tan'gun* as a historical figure and accused academic historians of sticking to anti-nationalist and colonial historiography. Recently professional historians in Korea have tried to rename them "pseudo-historians" (*Saibi sahakcha*) after the government revised national history textbooks acknowledging *Tan'gun* and his kingdom as historical facts.

102. Chadarevian, "Genetic Evidence" (ref. 3), 3.

103. Kim, interview 13 Aug (ref. 59).

academic trends in Korean history and archeology; instead, they selectively cited the literature without consulting anthropologists and historians. For instance, when they proposed the dual-origins hypothesis in 2003, Kim Wook's group cited the work of archaeologist Choi Mong-lyong and non-academic historian Yun Naehyŏn.

> According to Korea's founding myths, the Ancient Chosun [Kojosŏn] (the first state-level society of Korea) was established around 2333 BC in the region of Southern Manchuria but later moved to the Pyongyang area of Northwest Korea. . . . The predominant genetic relationship with Northern East Asians is consistent with other lines of evidence. . . . Historical evidence suggests that the Ancient Chosun was established in Manchuria and later moved to the Pyongyang area. Based on archeological and anthropological data, the early Korean population possibly originated in the northern regions of the Altai-Sayan and Baikal regions of Southeast Siberia.[104]

Here, they only cited a problematic narrative on ancient Korean history without considering its academic validity. Yun Naehyŏn had argued that Kojosŏn was established in 2333 BC in Manchuria and the Korea peninsula by regarding the *Tan'gun* myth as a historical fact, but this was neither accepted nor confirmed by mainstream scholars of Korean history. Furthermore, Choi Mong-lyong's explanation of the Baikal regions as being the prehistoric origin of Koreans had much in common with nationalistic claims and the *Tan'gun* myth. Since the early 1990s, many historians and archaeologists have criticized both these arguments and revealed many presumptions shared with Korean ethnic nationalism, including the idea of Korean ethnic homogeneity.[105] Rather than taking these problems seriously, geneticists claimed, "We are not concerned with the history in the context of the humanities and the academic debate on ancient Korean history that they have developed." They contended, "Our interest is only in studying genetic history—that is, finding Koreans' place in the history of human migration over the last 180,000 years."[106] The boundaries established between academic and genetic history and geneticists' selective use of Korean history

104. They stated the above paragraph in both 2003 and 2009 articles. Han-Jun Jin et al., "The Dual-Origins" (ref. 11), 28; Han-Jun Jin et al., "The Peopling of Korea" (ref. 85).

105. Song Ho-jung, "Controversy over Ancient Korean History, and How We should Respond," *Yŏksa wa Hyŏnsil: Quarterly Review of Korean History* (in Korean) 100 (2016): 17–51; Lee Pyungrae, "Modern Korean Intellectuals' Perception of Baikal: In Relation to the Origin of the Korean Race," *Korean Journal of Folk Studies* (in Korean) 39 (2016): 75–97.

106. Jin, interview 14 Feb (ref. 59).

and archaeological literature in their research revealed their genetic history's similarities with the nationalist narrative.

As we saw above, Kim Wook devised two rationales for tailoring his dual-origins hypothesis, one emphasizing the subtle distinction between *Tanil giwŏn minjok* and *Tanil minjok*, the other defining genetic homogeneity as a result of cultural homogeneity. Together with them, the similarity with the nationalist narrative of the dual-origins hypothesis made it possible for non-academic historians to co-opt the hypothesis to "scientifically" contend Korean ethnic homogeneity. During the history war with China over ancient Korean history, Korea's Ministry of Education revised high school history textbooks on ancient Korea, acknowledging the *Tan'gun* myth as a historical fact and the existence of Kojosŏn in 2000 BC, despite objections from academic historians and archaeologists. Non-academic historians strongly supported the government's nationalistic movement and began attacking academic historiography that did not support such arguments.[107] Under the circumstances, scientists inspired by non-academic historiography began using the dual-origins hypothesis to justify nationalistic arguments about Korean ancient history and origins. Lee Hong Kyu (born 1944), a professor at the Seoul National University College of Medicine, was one such scientist. In the late 1980s, he wrote a paper on Koreans originating from the Baikal region, inspired by non-academic historian Yun Naehyŏn's explanation of the history of Kojosŏn.[108] With rising popular ethnic nationalism during the history war, Lee tried to reinterpret the dual-origins hypothesis based on non-academic history and explained genetic history as follows: Proto-Mongolians moved from Africa 55,000 years ago and evolved in the Baikal region between 22,000 and 34,000 years ago. Around 10,000 years ago, they migrated to the area of the Liao River in Manchuria—regarded by Korean nationalists as the realm of Kojosŏn—and admixed with the small indigenous population who had come from Southeast Asia.[109] Lee

107. Stella Xu, "Reconstructing Ancient History—Historiographical Review of the Ancient History of Korea, 1950s–2000s," *ASIA Network Exchange: A Journal for Asian Studies in the Liberal Arts* 19 (2012): 14–22.

108. Lee Hong Kyu, interview by author, Seoul, 8 Feb 2017.

109. Lee Hong Kyu, *The Origin of Koreans: Our Past Seen Through Genetics, Archaeology, Linguistics, and Mythology* (Seoul: Uriyŏksa Yŏn'gu Jaedan, in Korean, 2010). This interpretation highlighting the Northern lineage more than the Southern lineage conflicted somewhat with the hypothesis of Kim Wook's group, which regarded the Southern male group as a main ancestor group of today's Koreans. Kim Wook did not accept Lee Hong Kyu's interpretation, despite recognizing his role as a popularizer of the genetic history of Koreans. Kim, interview 13 Aug (ref. 59).

considered this ethnic group to be the origin of Koreans and their civilization as the archetype of Korean culture. Lee also argued that "Korean people are ethnically homogenous" because "two different groups from Northern [the Baikal region] and Southeastern Asia perfectly mixed with each other and became a single ethnic nation a long time ago."[110] Lee Hong Kyu's reinterpretation of the dual-origins hypothesis became the "scientific" basis for the nationalist narrative of Korea's past. One non-academic historian claimed, "genomic science reveals that Koreans are a great ethnic nation, which once established the oldest civilization in human history, and share the same genetic structure of the ruler ethnic groups originating from the Baikal region and creating huge empires across Eurasia."[111]

Meanwhile, anti-multiculturalists adopted Kim Wook's explanation of cultural homogeneity happening prior to genetic homogeneity to fit genetic knowledge into the narrative of belief in Korean ethnic homogeneity. Since the government's official policy announcement on multiculturalism in 2006, anti-multiculturalists had claimed that "multiculturalism means the annihilation of a Korean ethnic nation [*Minjok malsal*]" because multicultural movements aim to build a multiethnic society by denying the ethnic purity of Koreans and encouraging miscegenation.[112] Yi Wŏnho of the Anti-Multicultural Policy League, the biggest online organization for anti-multiculturalists, argued that, despite the admixture of Koreans in the ancient period, their genes had mixed into the Korean ethnic nation for several hundred years and had already formed a uniform gene pool. He concluded that Koreans were an ethnically homogenous nation because all Korean individuals had the same mixed genes.[113] Another anti-multiculturalist propagandist book, titled *To Suspend Multiculturalism*, also claimed that Koreans were an ethnically homogeneous nation despite criticism from genetics. The author Kim Kyuch'ŏl recognized that Koreans had never been single-origin people, nor did they have a genetically pure lineage. Despite his recognition, he

110. Lee Hong Kyu, *The Origin of Koreans* (ref. 109), 10.

111. Hong Ik'ŭi, "Tracing the Origin of the Korean People via DNA Genes Shows . . . ," *Chosŏn Ilbo* (in Korean), 26 Oct 2015. On the similar argument made by a monograph, see Kim Sŏktong, *Kim Sŏktong's Search for the Korean Ethnic Nation's DNA* (Seoul: Gimmyoung Publishers, in Korean, 2018).

112. Kang Jin-Gu, "A Study of the Anti-Multicultural Discourse of Korean Society with a Focus on the Internet Domain," *Studies in Humanities* (in Korean) 32 (2012): 5–34, on 14.

113. Yi Wŏnho, "Multiculturalism, a Road to the Coexistence of Mankind or a Trap for the Annihilation of the Ethnic Nation?" Overseas Koreans Are the Major Force of Multicultural Policies (online community); http://blog.daum.net/dali27/140 (accessed 20 May 2017).

claimed that hereditary (or genetic) homogeneity could be more or less formed if historical and cultural homogeneity was sustained over several hundred years. Following such definition, he contended that Koreans were ethnically homogeneous because they had developed genetic homogeneity by living together and sharing culture over one thousand years.[114] Political scientist Kim Young Myung, one of the few academic scholars hostile to multiculturalism in Korea, reconciled the dual-origins hypothesis to Korean ethnic homogeneity precisely in the same way as Kim Wook had. He supposed that, despite the diverse origins of Koreans, Koreans could be seen as a homogeneous population because they had mixed over a long history and thus became unified.[115]

All proponents and opponents of multicultural policy along with nonacademic historians instrumentalized the dual-origins hypothesis when they struggled with the reconfiguring of Korean ethnic identity. Genetic knowledge of Korean origins—which had been produced in the context of domestic economic liberalization, the rise of popular nationalism and multiculturalism, and globalization of genetic history—was incorporated into the controversy of multiculturalism and nationalism circularly. The research into Korean origins, initially funded and to a certain extent motivated by governmental desires to protect Korean history and thus territory from China, was fed back into the same argument but used as justification for both sides—it both scientifically proved that Korea was not a single-origin ethnic nation on the one hand, and on the other, the way it was interpreted to placate the motivations of the government body that had funded it, made it fit with the nationalist rhetoric and saw it used as justification for Korea as a homogeneous ethnic nation today. In this way, the dual-origins hypothesis became an essential part of the politics of Korean national identity.

CONCLUSION

Jin Han-Jun, Kim Wook's protégé and main collaborator in the dual-origins hypothesis, published a paper on the genetic history of Koreans using genome-wide, single-nucleotide polymorphism (SNP) arrays in 2013. According to him,

114. Kim Kyuch'ŏl, *To Suspend Multiculturalism* (Paju: tosŏch'ulp'an han'gang, in Korean, 2012), 123–25.

115. Kim Yung-Myung, "Critical Considerations for Multi-Cultural Discourses and Policies in Korea," *Journal of Korean Political and Diplomatic History* (in Korean) 35 (2013): 141–74, on 151.

this study confirmed the dual-origins hypothesis by using neutral bi-parental autosomal markers. Like his teacher, he was also convinced that new genomic technologies had allowed population geneticists to "dissect the genetic structure of the Korean population," and that they had revealed the people's "genuine history" as well as offering a chance to correct the widespread "misconception about Korean's ethnic characteristics."[116] Population geneticists were not alone in the conviction that genetic knowledge and technologies could be helpful in revealing national histories and "genuine" identities of Koreans. Both enthusiasts and skeptics of multicultural policy included the dual-origins hypothesis in their claims concerning national belonging. Even non-academic historians took genetic knowledge and used it as a basis for a scientific endorsement of a nationalist history.

In this paper, I have tried to illuminate the way in which DNA became a critical source in the reconstruction of Korean national identity in the context of globalization. The rise of the genetic history of Koreans was neither a result of the government-led national genomic projects nor a unilateral influence of global genome initiatives. I have shown that economic liberalization, multiculturalism, the history war, and the transnational network of genetic origins pushed Korean geneticists to question Korean ethnic homogeneity and develop the dual-origins hypothesis, and later the hypothesis became part of socio-political debates on national identity again. This co-production of population genetics and national identity can be similarly identified with other countries, e.g., Brazil.[117] However, in contrast to the Brazil case, which saw geneticists develop several conclusions about Brazilians' genetic constitutions and national histories, Korean geneticists reached only one conclusion about the past of Koreans—the dual-origins hypothesis—and this sole set of genetic knowledge was used equivocally both in favor and against multiculturalism in modern Korea. Its political malleability can only be understood in the context of Kim Wook's effort to fit transnational genetic history with the expectations of the local political context.

The Korean case also gives some insight regarding the politics of the historical expertise that genetic history studies brought to the fore. Geneticists'

116. Young Jin Kim and Han Jun Jin, "Dissecting the Genetic Structure of Korean Population Using Genome-Wide SNP Arrays," *Genes & Genomics* 35 (2013): 355–63, on 357; Jin, interview 14 Feb (ref. 59).

117. Michael Kent, Ricardo Ventura Santos, and Peter Wade, "Negotiating Imagined Genetic Communities: Unity and Diversity in Brazilian Science and Society," *American Anthropologist* 116 (2014): 736–48.

lack of historical expertise was a common criticism made by science studies scholars exploring genetic history studies.[118] Furthermore, Yulia Egorova found that historians and geneticists studying the past of Jewish and Indian groups were indifferent toward each other and deliberately kept a distance from each other's respective research outcomes; geneticists believed that historical evidence was less objective than genetic evidence, while historians were suspicious of the validity of genetic evidence for historical research purposes.[119] Both groups continuously demarcated disciplinary boundaries between history and genetics in order to protect their own disciplinary values. This friction took on a more aggressive form in Korea, particularly from the humanist side. Academic archaeologists and historians decried the genetic history as "a mixture between an author's imagination and other pieces of scientific evidence based on chauvinistic patriotism and nationalism."[120] Such critical response was rooted in genetic history's involvement in the debate between non-academic and academic historians about Korea's past. Although geneticists claimed their neutrality (or indifference) to the historical debate on ancient Korea so as to defend their scientific objectivity, they in fact produced genetic knowledge in favor of the non-academic historians in the context of securing research funding in line with rising nationalism. In this respect, the politics of science funding led geneticists to be involved in the politics of historical expertise. In contrast to Egorova's Jewish case, as a result, the genetic history of Koreans was not unrelated to the historical debate, but central to the politics of history.

Genetic knowledge's involvement in the politics of national identity continues. In the summer of 2018, the influx of 500 Yemen refugees to Korea's Jeju island reignited the national debate on migration and national identity. Koreans both protesting and supporting the acceptance of the Yemenis made use of the dual-origins hypothesis to justify their political positions and to reconfigure (or defend) Korean identity. Belief in Korean ethnic homogeneity was quickly cited as a primary cause of the reaction against the Yemenis.[121] Song Hokeun, a chair professor of sociology at Seoul National University, criticized the reaction against the Yemenis and claimed that Korea was a multi-racial and

118. Nadia Abu El Haj, *The Genealogical Science: The Search for Jewish Origins and the Politics of Epistemology* (Chicago: University of Chicago Press, 2012), 234–41.

119. Egorova, "DNA Evidence" (ref. 4).

120. Yi Seonbok, "The Truth and Falsehood of Scientific Evidence," *Ingenium* (in Korean) 11 (2004): 99–107.

121. Se-Woong Koo, "South Korea's Enduring Racism," *New York Times*, 1 Jul 2018.

ethnically heterogeneous country, referencing the Northern and Southern origins of Koreans.[122] On the other side, *Ilbe Storage*, a cybercommunity of ultra-right-wing South Korean men, demanded Yemenis "Refugees out," highlighting Korean ethnic homogeneity as justified by genetic knowledge. One *Ilbe* user contended, just as Kim Wook did in his GRF-funded research, that current Koreans were genetically homogeneous despite diverse origins in the pre-history era.[123] As long as immigration issues remain an important problematic in contemporary Korean society, the attempt to reconfigure Korean ethnic identity through dissecting the genetic origins of Koreans will be continuously pursued.

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122. Song Hokeun, "549 Refugees knocked the Door of a Pure-race Country for 600 Years," *Chungang Ilbo* (in Korean), 26 Jun 2018.

123. "Refugees Out: The Reason Why Koreans are an Ethnically Homogeneous Nation," *Ilbe Storage*; http://www.ilbe.com/10642485889 (accessed 17 Sep 2018).