

WOMEN IN IMMUNOLOGY

Lydia Rabinowitsch-Kempner,
a TB researcher and role model

Lydia Rabinowitsch-Kempner (1871–1935) was not only at the forefront of tuberculosis (TB) research, but also an early role model for women researchers.

Lydia was born in Lithuania and studied botany and zoology from 1889 to 1894 as one of the first female PhD students in Switzerland. At the time, Switzerland was among the few countries where women were permitted to study to this level. After her PhD, she moved to Berlin to carry out research in medical bacteriology in the newly established Institute of Infectious Diseases, founded by Robert Koch. Koch's discovery of the aetiology of TB, among others, attracted many young scientists from all over the world. Lydia was the Institute's first female researcher when she joined in 1894. In 1895, she moved to the United States to teach bacteriology at the Women's Medical College of Pennsylvania, where she was later appointed associate professor of pathology. She stayed there until 1898, also remaining affiliated with the Institute in Berlin. After her marriage to Walter Kempner, who was also a researcher at the Institute of Infectious Diseases, she returned to Berlin to continue her work there. She left the Institute in 1903, faced with the refusal of her male colleagues to collaborate with her. Soon after she was offered a position by the Pathology Institute of the Charité Clinics, but still without salary. To secure financial support for their family, Walter in the meantime had started to work as a medical practitioner.

Lydia's research mainly focused on the transmission of *Mycobacterium tuberculosis* and *Mycobacterium bovis* by dairy products. This was a major issue at the time, with both societal and scientific impact. Her work was important for clarifying that TB in cattle was caused by *M. bovis* and not by *M. tuberculosis* — a finding that was in contrast to what Robert Koch had originally stated. Lydia's identification of *M. tuberculosis*

in the dairy products of one of the major providers in Berlin led to a number of legal confrontations. Another intriguing finding she made was that *Mycobacterium butyricum* — which she and Walter had isolated from dairy products — caused a strong immune response provided that it was administered with residual butter. Ultimately, this discovery led to the development of complete Freund's adjuvant, which is composed of killed mycobacteria emulsified in oily substances and has been widely used in research since.

In 1912, Lydia was appointed professor — although without any teaching duties or financial compensation — making her one of the first female professors in Germany. She became a strong supporter of the Bacillus Calmette–Guérin (BCG) vaccine, which was developed by the French researchers Albert Calmette and Camille Guérin and remains the only TB vaccine still in use today. This was a particularly sensitive issue at the time because of the so-called 'Lubeck disaster' in 1930, in which a large proportion of BCG-vaccinated infants had died. The question was whether this was due to the vaccine itself or to contamination with *M. tuberculosis*, with the latter ultimately being identified as the cause of this tragedy.

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In 1920, Lydia was appointed director at the Bacteriologic Institute of the Moabit Hospital in Berlin, finally with salary and budget. However, attempts to promote her to professor with teaching obligations failed. Lydia and Walter (who passed away in 1920) were both Jewish, and the rise of the Nazi party ultimately led to her forced retirement. Their eldest son Robert, an attorney who was an active opponent of the Nazi regime, was arrested in 1935. Owing to the support of Lydia's colleagues, Robert was released, but Lydia passed away later in 1935. Robert left Germany shortly after this, first moving to Italy and then to the United States. Ten years later, he returned to Germany as assistant US Chief Council for the International Military Tribunal at Nuremberg.

From her time at the Women's Medical College of Pennsylvania, Lydia became strongly involved in the women's movement. In Berlin, she was a member of numerous feminist organizations, notably those dedicated to providing interest-free financial support to women students and single mothers. She also supported sex education of school children and young women, and maternity leave insurance. Last but not least, she became a strong advocate for fighting TB as a major threat to families.

In sum, Lydia Rabinowitsch-Kempner made her way as a successful researcher and advocate for women's rights, and despite many difficulties succeeded in finding a balance between family and work. She thus is an excellent role model for all who strive for equal rights in science and beyond.

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Competing interests

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ORIGINAL ARTICLE Rabinowitsch, L. Zur Frage des Vorkommens von Tuberkelbacillen in der Marktbutter. *Zeitschr. f. Hygiene* **26**, 90–111 (1897) | Rabinowitsch, L. Die Beziehungen der menschlichen Tuberkulose zu der Perlsucht des Rindes. *Berl. Klin. Wochenschr.* **43**, 784–788 (1906)

RELATED ARTICLE Graffmann-Weschke, K. Lydia Rabinowitsch-Kempner (1871–1935). Leben und Werk einer der führenden Persönlichkeiten der Tuberkuloseforschung am Anfang des 20. Jahrhunderts (GCA-Verlag, 1999)



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