

There's Science in the Kitchen-July 2024

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[CITATION]

Dođan, M., (2024). Élie Metchnikoff (1845- 1916) Pioneer of Probiotic Foods. *Istanbul Geliřim University Faculty of Fine Arts E-Bulletin*, (49), İGÜ Yayınları, İstanbul.

July 2024

ÉLIE METCHNIKOFF

(1845- 1916)

PIONEER OF PROBIOTIC FOODS

Assoc. Prof. Dr. Murat Doğan*

Dear readers, is there anyone who doesn't know Pasteur? If I asked this question, you would surely respond, "Of course we know him." Now, if I asked the same question about Metchnikoff, many of us would probably say we don't know him. So, let me get straight to the point. Elie Metchnikoff (Ilya Mechnikov) was one of Louis Pasteur's closest colleagues. However, his life was quite tumultuous, and perhaps this is why he is not very well-known. He journeyed from Ukraine to Russia, then to Germany, and finally ended his journey in France. In his 71-year life, he experienced two marriages, two suicide attempts, multiple heart attacks, many discoveries, and a Nobel Prize.

First Years

Ilya, the youngest of five siblings, was born in 1845 in a village near Kharkiv, Ukraine. He spent his early childhood in Russia. Although his family was initially wealthy, they later became impoverished and started horse breeding. During his childhood, he developed an interest in nature, natural history, and science. His family always encouraged his education, and he graduated from high school with a gold medal. He then attended Kharkiv University and completed the four-year program in just two years at the age of

19. Afterward, he received education from the famous taxonomy expert Rudolf Leuckart in Giessen, Germany. Following Giessen, he continued his studies at the University of Göttingen, the Munich Academy, and the Munich Von Siebold Laboratory. Although his expertise was in Zoology, making him a zoologist, we are more interested in his pioneering studies and scientific views on probiotics.

His Youth and Works

Elie Metchnikoff married Ludmilla Feodorovitch in St. Petersburg. When his wife Ludmilla, who was gravely ill at the time, passed away, Metchnikoff attempted suicide by taking an overdose of medication but survived by chance. Later, in 1875, he met and married his second wife, Olga, in Odessa. When Olga fell ill, he conducted a scientific experiment by injecting her blood into himself, which caused him to experience similar symptoms.

In 1881, after the assassination of the Russian Tsar, Metchnikoff decided to leave Russia. He went to Louis Pasteur, and from him, he learned methods for treating rabies, which he tried to develop further at an institute in Odessa. However, due to conflicts with the medical board there, he left the institute in 1888. He then moved to Paris, where he became the director of the Research Institute at Pasteur's invitation. Metchnikoff worked there for the remainder of his career, made significant contributions to immunology, and won the Nobel Prize in 1908 for his discovery of phagocytes.

From 1913 onwards, Metchnikoff began experiencing heart problems, and the outbreak of World War I caused him great distress. Despite recurring heart attacks, he continued to work and write until his death.

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Metchnikoff researched the aging process and nutrition of humans, suggesting that fermented dairy products could extend human lifespan and improve gut health. He studied his own aging process and proposed that with scientific advancements, the human lifespan could reach 120 years. He identified microbial imbalances in the colon as the cause of harmful fermentation, believing that the digestive system determined lifespan. He attributed aging symptoms such as wrinkles, graying hair, muscle weakness, memory loss, and forgetfulness to gut toxins, arguing that eliminating these toxins could reverse aging.

Dear readers, the theory that gut health affects overall health, which is widely recognized today, was actually proposed by Metchnikoff a century ago. To support his theories, he conducted research in Bulgarian and Caucasian villages. Even in his final moments, he requested an autopsy after his death to better understand gut health, demonstrating his lifelong and posthumous dedication to science. Observing that Bulgarian and Caucasian villagers who consumed fermented dairy products had better health, he emphasized the importance of hygienic nutrition and the consumption of fermented products. Metchnikoff particularly recommended fermented dairy products because he believed the lactic acid bacteria (LAB) in them produced lactic acid, preventing harmful gut microbes.

Years later, following his recommendation, yogurt production began in France, and his ideas popularized fermented dairy products in Paris. Probiotics, beneficial live microorganisms that support gut microbiota balance, align with Metchnikoff's findings, though he did not use this term. Probiotics support healthy development, aid in disease treatment, and act as natural supplements by competing with harmful microorganisms and colonizing the gut surface.

In conclusion, Metchnikoff discovered that villagers in the Caucasus Mountains consumed fermented dairy products daily and that these products contained health-improving microorganisms that extended their lifespan.

Assoc. Prof. Dr. Murat Doğan

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ISSUE: 49



FFA E-BULLETIN

JULY 2024



ISTANBUL
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Faculty of
Fine Arts

CONTENTS

HIGHLIGHTS 1-5

SUCCESSSES 6-11

EXHIBITIONS 12-13

NEWS FROM
FFA 14-25

SCIENTIFIC
STUDIES 26-31

32-42

ARTISTIC
ACTIVITIES

43-47 INTERVIEWS

48-59

CULTURAL
JOURNEY

60-63 GASTRONOMY
JOURNEY



GASTRONOMY JOURNEY

**ASSOC. PROF. DR. MURAT DOĞAN'S
ARTICLE TITLED "ÉLIE METCHNIKOFF (1845-
1916): PIONEER OF PROBIOTIC FOODS"
HAS BEEN PUBLISHED!**



The text regarding the monthly article of Assoc. Prof. Dr. Murat Doğan, Vice Dean of the Faculty of Fine Arts (FFA) at Istanbul Gelişim University (İGU) and a faculty member of the Department of Gastronomy and Culinary Arts, is provided below.

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