

Kovalevsky, Alexander Onufrevitch

Introductory article

Online posting date: 18th October 2010

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Russian embryologist and invertebrate zoologist Alexander Onufrevitch Kovalevsky (1840–1901) was one of the founders of cellular and evolutionary embryology. His acclaimed scientific work focused on embryological and invertebrate anatomy of amphioxus, ascidians and other invertebrates. The innovation of this work was to trace the history of adult tissues cell-by-cell from the original egg-cell. Based on these studies, Kovalevsky proposed an evolutionary theory of germ layers and argued that the process of gastrulation is homologous among all animals. Along with his friend and colleague Ilja Iljich Metschnikoff, Kovalevsky published detailed descriptions of most major invertebrate groups. His combination of detailed embryological observations and evolutionary considerations make Kovalevsky one of the founders of an approach now called evolutionary developmental biology.

Russian embryologist and invertebrate zoologist Alexander Onufrevitch Kovalevsky was one of the founders of cellular and evolutionary embryology. In his studies of the development of amphioxus, ascidians and other invertebrates he made use of histological methods championed by Albert Kölliker (1817–1905) and Robert Remak (1815–1865). Kovalevsky's innovation was to trace the history of adult tissues cell-by-cell from the original egg-cell, which lead him to propose an evolutionary theory of germ layers, and to argue that the process of gastrulation is homologous among all animals. **See also:** [Remak, Robert](#)

Born in 1840 near Witebsk (now in Belarus), Kovalevsky enrolled at University of St. Petersburg in 1859 to study natural sciences. He studied abroad first at the University of Heidelberg and then at the University of Tübingen, where he learned histological methods from Franz von Leydig (1821–1908). In 1864 Kovalevsky moved to Naples to investigate the development of Amphioxus. Awarded a

masters in Zoology from University of St. Petersburg in 1865, he promptly returned to Naples where he undertook a pathbreaking study of ascidians. This work triggered a debate about the phylogenetic position of ascidians as several distinctive homologies suggested a close link between ascidians and vertebrates. Also in Naples Kovalevsky met Ilja Iljich Metschnikoff (1845–1916), who became a close friend and colleague and with whom he had a long and productive collaboration on the ontogenetic description and evolutionary classification of most invertebrate groups. Kovalevsky's combination of detailed embryological observations and evolutionary considerations make him one of the founders of an approach now called evolutionary developmental biology. **See also:** [Metschnikoff, Elie \(Ilya\)](#)

Kovalevsky gained international scientific recognition for his early embryological work accomplished in Naples. For his studies in developmental and evolutionary biology he subsequently became inducted into many notable scientific academies, including the Russian Academy of Sciences and the Royal Society (as a foreign member). During his career in Russia he was professor at his *alma mater*, as well as in Kiev, Odessa, and at Novorossiysk Universities. The British embryologist Edmond Ray Lankester described Kovalevsky as courteous, gentle and dedicated to his microscopical work. He married in 1868 and had two daughters and a son. Today his memory lives on in the Kovalevsky Medal, awarded for outstanding achievements in comparative zoology, embryology and evolutionary developmental biology by the St. Petersburg Society of Naturalists. Kovalevsky died in 1901.

Further Reading

Lankester ER (1902) Alexander Kowalevsky. *Nature* **1712**: 394–396.

Levit G (2007) The roots of Evo-Devo in Russia: is there a characteristic 'Russian Tradition'? *Theory in Biosciences* **126**: 131–148.

ELS subject area: Science and Society

How to cite:

Ulett, Mark A (October 2010) Kovalevsky, Alexander Onufrevitch. In: Encyclopedia of Life Sciences (ELS). John Wiley & Sons, Ltd: Chichester. DOI: 10.1002/9780470015902.a0002851