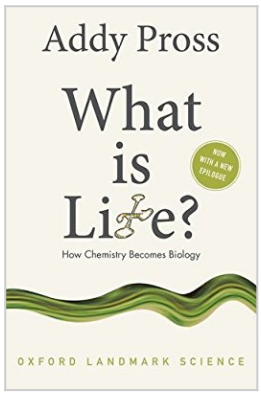

What is Life?: How Chemistry Becomes Biology (Oxford Landmark Science)

By Addy Pross

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Seventy years ago, Erwin Schrodinger posed a profound question: 'What is life, and how did it emerge from non-life?' This problem has puzzled biologists and physical scientists ever since.

Living things are hugely complex and have unique properties, such as self-maintenance and apparently purposeful behaviour which we do not see in inert matter. So how does chemistry give rise to biology? What could have led the first replicating molecules up such a path? Now, developments in the emerging field of 'systems chemistry' are unlocking the problem. Addy Pross shows how the different kind of stability that operates among replicating molecules results in a tendency for chemical systems to become more complex and acquire the properties of life. Strikingly, he demonstrates that Darwinian evolution is the biological expression of a deeper, well-defined chemical concept: the whole story from replicating molecules to complex life is one continuous process governed by an underlying physical principle. The gulf between biology and the physical sciences is finally becoming bridged.

This new edition includes an Epilogue describing developments in the concepts of fundamental forms of stability discussed in the book, and their profound implications.

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Review

"In this inspiring book, Pross provides an engaging account of the view that systems chemistry can bridge the hitherto unassailable abiogenic/biogenic divide. In a carefully constructed, almost forensic, analysis, he confronts crucial issues, such as the conceptual gulf between the biochemist's chicken and egg problem...and the fundamental role of dynamic kinetic stability in the process of life." --*The Biologist*

About the Author

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Addy Pross received a Ph.D in Organic Chemistry from Sydney University in 1970. He is currently a Professor of Chemistry at Ben Gurion University of the Negev, Israel, and a recognized authority in the area of chemical reactivity to which he contributed with the highly cited and acclaimed Pross-Shaik model of chemical reactivity. He has held visiting positions in many universities word-wide, including the University of Lund, Stanford University, Rutgers University, University of California at Irvine, University of Padova, the Australian National University Canberra, and Sydney University. He has served on the editorial board of chemical and biological journals and a variety of academic management boards. In recent years he has directed his attention to the biological arena where he has applied his expertise in chemical reactivity to the Origin of Life problem and the broader question of the problematic chemistry-biology interface.

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