Ilya Raskin

BIOGRAPHICAL SKETCH

PERSONAL:

Born: - January 16, 1956, Moscow, Russia
Nationality: - US citizen
Marital Status: - Married, two children

EDUCATION:

1980-1984 - **Ph.D.** Michigan State University, East Lansing, MI, USA
1977-1980 - **B.S.** Brandeis University, Waltham, MA, USA
Magna Cum Laude with Highest Honors in Biology
1973-1976 - Medical School #28, Moscow, Russia
1972-1973 - Moscow Pedagogical University, Moscow, Russia

EMPLOYMENT HISTORY:

2000-Present - **Distinguished Professor**, Center for Agricultural Molecular Biology, Rutgers University, New Brunswick, NJ
2005-Present - **President**, Global Institute for Bioexploration (GIBEX)
2006-Presnt - **Adjunct Professor,** Pennington Biomedical Research Center / LSU
2010-Present - **Chairman and Partner**, Nutrasorb LLC.
1996-2011 - **Director and Chief Scientific Advisor,** Phytomedics Inc.
1994-2000 - **Professor**, Center for Agricultural Molecular Biology, Rutgers University, New Brunswick, NJ
1993-1998 - **Director,** Phytotech Inc., Monmouth Junction, NJ
1989-1994 - **Associate Professor**, Center for Agricultural Molecular Biology, Rutgers University, New Brunswick, NJ
1986-1989 - **Principal Investigator**, Central Research and Development Dept., DuPont Co., Wilmington, DE
1984-1986 - **Associate Plant Physiologist**, Shell Agricultural Chemical Company, Modesto, CA

HONORS AND AWARDS:

2008 - Elected member of the European Academy of Sciences and Arts
2005 - Thomas Alva Edison Patent Award for the revolutionary product innovations and scientific breakthrough
2002 - One of 108 most cited researchers in Plant and Animal Science, ISI
2000 - Named Century Innovator in Botany by the Outlook 2000 issue of U.S. News & World Report
2000 - Sustained Research Excellence Award, Rutgers University
1999 - World Technology Award for Biotechnology (finalist)
1998 - Research Excellence Award, Rutgers University
1997 - Discover Award for Technology Innovation (finalist)
1996 - Board of Trustees Award for Excellence in Research, Rutgers University
1993 - Charles A. Shull Award, American Society of Plant Physiologists, for outstanding investigations in the field of Plant Physiology
1992 - Research Excellence Award, Rutgers University
1989 - Accomplishment Award, Du Pont Co.
1986 - Special Recognition Award, Shell Agricultural Chem. Co.
1983-1984 - Shell Distinguished Research Assistantship and Travel Award, Michigan State University
1984 - Ernest A. Bessey Memorial Award for Excellence in Research, Michigan State University

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SELECTED PROFESSIONAL SERVICES & ACCOMPLISHMENTS:

- Ad-hoc reviewer of manuscripts for 18 scientific journals and grants for 9 agencies and foundations
- Presented over 250 invited lectures at professional meetings, universities, and companies (since 1993)
- Involved in organizing 14 scientific meetings
- Published 225 conference abstracts (since 1991)
- Received over $25 MM in research grants
- Featured in over 50 popular science articles and 8 TV and radio science shows
- Trained 9 graduate students, 35 postdoctoral fellows, and 6 assistant research professors

IMPORTANT CONTRIBUTIONS TO SCIENCE:

1. Mechanisms of growth and aeration in rice. Before my Ph.D. work, it was not understood how deep-water rice plants coordinate their stem elongation with rising paddy water and maintain adequate oxygen supply to the roots. Working with a small group of scientists, we have discovered that water traps the gaseous plant hormone ethylene in the submerged parts of rice stems causing rapid activation of genes responsible for stem elongation, while it slows down once the stems reach the water surface and ethylene diffuses out of the above water parts. At the same time, submerged rice roots can get enough oxygen by creating an active "snorkel" effect resulting from the reduction of pressure in the air-conducting system of the plant caused by consumption of oxygen and solubilization of respiratory carbon dioxide in the surrounding water. This work was published as a cover article in Science (1985) and has since been incorporated in many plant biology and agronomy textbooks.

2. Salicylic acid as a new plant hormone involved in plant thermogenesis and systemic disease resistance. A number of plant inflorescences (e.g. in Araceae family) produce heat to volatilize odiferous compounds that attract insect pollinators. While the biochemical mechanism of heat production in plants (uncoupling of mitochondrial electron transport chain) has been known, biochemical signals responsible for committing mitochondria towards heat production remained elusive. In 1987, we identified salicylic acid as an endogenous regulator of heat production in Araceae – a discovery that made the covers of both Science and in Nature. Subsequently, we identified salicylic acid as the key endogenous signal that activates systemic plant resistance to pathogens, resulting in another publication in Science. That work was followed by our cover paper in Nature that demonstrated that damaged plants convert salicylic acid to volatile methyl salicylate, which functions as an airborne signal capable of activating pathogen and herbivore resistance in neighboring plants. These discoveries added salicylic acid to a short list of recognized plant hormones and were also incorporated in most plant biology textbooks.

3. Phytoremediation – using metal accumulating plants to remove heavy metal pollutants from soil and water. We have coined the term phytoremediation in 1994 to define the technology of using metal accumulating plants to remove heavy metal pollutants from soil and water. We have identified a number of plants that can accumulate large quantities of heavy metals, such as Pb, Cr, Cu, Cd, Zn as well as some radioactive isotopes in the above ground parts, thus depleting polluted soil and water from these toxic elements. We have also elucidated several biochemical mechanisms involved in metal concentrations, and developed and subsequently transferred phytoremediation technology to bioremediation companies that have successfully used it in the field. Our first phytoremediation papers and reviews on this subject (see below) have the highest citation index of any work my group has published (over 2000).

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4. Plants and human health. In the last 15 years, the interest of my research team has shifted to discovery and characterization of pharmacologically active natural products from plants, enhancing their levels and defining their modes of action in in vitro, in vivo and clinical models. Working on the interface of pharmacology, molecular biology, plant biochemistry, and microbiology we have published over 100 manuscript related to this subject covering a variety of bioactive phytochemicals and molecular targets. Our most notable, recent contributions to this area are: isolating and characterizing anti-diabetic compounds from Tarragon (*Artemisia dracunculus*) and elucidating their molecular action in decreasing insulin resistance (14 papers published since 2006); developing a new method for the effective concentration, stabilization and delivery of dietary polyphenols (currently utilized by food industry); developing a new variety of lettuce with antioxidant polyphenols levels higher than those in blueberries (currently available in stores); describing highly active and stable anti-inflammatory and chemoprotective isothiocyanates from *Moringa olifera* (developed into commercial ant-aging cosmetic ingredient); and discovering the effect of dietary polyphenols on gut microbiome as it relates to metabolic syndrome and gut health.

5. International Extension. Over the years, my laboratory participated in multiple international collaborative programs with researchers in Africa, Asia and South America. Major international programs I currently lead involve the Global Institute for BioExploration, which partners with 22 Universities in 17 countries on 4 continents to transfer technologies for ethical, natural product-based pharmacological bioexploration that benefit human health and the environment, and the International Research Training Center for Botanicals and Metabolic Syndrome in Tajikistan (funded by NIH).

PUBLICATION LIST (Ilya Raskin) Also see:

https://scholar.google.com/citations?hl=en&user=7k2HHF4AAAAJ&view_op=list_works&sortby=pubdate

http://www.ncbi.nlm.nih.gov/sites/myncbi/ilya.raskin.1/bibliography/47580798/public/?sort=date&direction=descending

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219. Kellog, J., N.J. Plundrich, M.A. Lila, D.B. Croom, R.F. Taylor, B. Graf, **I. Raskin**. 2016. Engaging American Indian/Alaska Native (AI/AN) Students with Participatory Bioexploration Assays. NACTA Journal 60:42-50.

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