ANALYSIS

# A HISTORY OF Scientific Breakthroughs

**1955** — **Jonas Salk,** founder, unveils the first safe, effective polio vaccine

**1962** — **Francis Crick,** Salk founding fellow, wins the Nobel Prize for the discovery of the structure of DNA and its role in information transfer in living material

**1966** — **Suzanne Bourgeois** joins the Salk Institute and goes on to establish the Regulatory Biology Laboratory and conduct pioneering work on the regulation of gene expression

**1968** — **Robert W. Holley** wins the Nobel Prize for the interpretation of the genetic code and its function in protein synthesis

**1970** — **Catherine Rivier** joins the Salk Institute, where she identified a large number of hormonal functions and new endocrine pathways throughout the body

**1975** — **Renato Dulbecco** wins the Nobel Prize for discoveries concerning the interaction between tumor viruses and the genetic material of the cell

**1977** — **Roger Guillemin** wins the Nobel Prize for discoveries concerning the peptide-hormone production of the brain

**1979** — **Tony Hunter** and **Bart Sefton** discover tyrosine phosphorylation, which leads to the creation of a class of cancer drugs known as tyrosine kinase inhibitors (e.g., Gleevec, Iressa, Tarceva)

**1981** — **Wylie Vale** and colleagues discover, isolate and characterize corticotropin-releasing hormone, involved in the body's response to stress

**1982** — **Stephen Heinemann** and colleagues clone first nicotinic receptor gene, providing a critical tool to pursue receptors on brain cells

**1985** — **Ursula Bellugi** leads the way to the watershed discovery that the left hemisphere of the brain becomes specialized for languages, both spoken and signed

**1985** — **Ronald Evans** discovers a large family of molecules, called nuclear hormone receptors, that respond to various steroid and thyroid hormones as well as vitamins, revealing primary targets in the treatment of many cancers

**1989** — **Terrence Sejnowski** and colleagues demonstrate a brain change (long-term depression) thought to be critical to memory formation

**2002** — **Sydney Brenner** wins the Nobel Prize for discoveries concerning genetic regulation of organ development and programmed cell death

**2002** — **Rusty Gage** discovers that the adult brain continues producing new neurons throughout the life span in a process called neurogenesis, contrary to accepted dogma

**2003** — **Reuben Shaw** discovers that a gene altered in some lung cancers regulates an enzyme used in therapies for diabetes, paving the way for new treatments

**2014** — **Susan Kaech** discovers a way to inhibit tumor growth in melanoma and lung cancer by stimulating a certain cell receptor in animal models, with implications for new human therapies

**2017** — **Joanne Chory** wins the Breakthrough Prize for her pioneering work deciphering how plants optimize their growth, development and cellular structure to transform sunlight into chemical energy

**2017** — **Juan Carlos Izpisua Belmonte** and his team discover a new type of stem cell that may help overcome a major hurdle in growing replacement organs for humans