

## How to Win an (Ig)-Nobel Prize – Interview with Prof. Klaus Roth

Klaus Roth<sup>1</sup> is an emeritus professor at the Freie Universität Berlin. He studied chemistry at the Freie Universität Berlin from 1964 – 1969 and completed his dissertation at the same university in 1973. After a post-doctoral stay at the Institute for Medical Research in Mill Hill, London from 1979 – 1980, he completed his habilitation at the Freie Universität Berlin in 1981. Between 1986 – 1988, he held a position as visiting professor at the University of California in San Francisco, after which he returned to his home university as extraordinary professor and became full professor in 2000. During his research career, he dealt with many aspects of NMR spectroscopy and also popular science such as the chemistry behind licorice sweets, balloons, and *la fée verte*. Furthermore, he is interested in the Ig Nobel Prize, a scientific award similar to the “regular” Nobel Prize but somewhat more peculiar. In this interview, he gives an insight into this alternative award.



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**JUnQ:** Can you give us a brief history of the Nobel Prize?

**Roth:** The Swedish chemist and inventor Alfred Nobel established the awards in his last will. Each year a prize is given in the categories Physics, Chemistry, Physiology or Medicine, Literature, and Peace, to those “who, during the preceding year, have conferred the greatest benefit to mankind.” The first Nobel prizes were awarded in 1901 to Röntgen in Physics, van’t Hoff in Chemistry, and von Behring in Physiology or Medicine. The Nobel Prize is the most prestigious award available and is the secret dream of every scientist. By the way, it is also a lot of money, around one million Euros.

**JUnQ:** What is the Ig Noble Prize?

**Roth:** The Ig Nobel Prizes honor achievements that make people laugh and then think. The prizes are intended to honor a scientist’s curiosity and to celebrate unusual and sometimes weird studies. In late September, in a gala ceremony in Harvard’s Sanders Theatre, the new winners step forward to accept their prizes in front of more than 1000 excited spectators. Although the prizes come with no cash and the winners have to cover their travel expenses on their own, the prizes are physically handed out by bemused genuine Nobel Laureates.<sup>[1]</sup>

**JUnQ:** How did the Ig Noble Prize evolve?

**Roth:** The Ig Nobel Prize was created by people who also founded the Journal of Irreproducible Results. When the Journal’s publisher decided to abandon the magazine, the staff decided to continue their work. Unable to use the old

name, they started a new publication: Annals of Improbable Research. The editor and spiritus rector is Marc Abrahams and, since 1991, he and his team have been organizing the annual Ig Nobel Prize ceremony.

**JUnQ:** The selection of laureates for the “regular” Nobel Prize is somewhat mysterious. By whom and how are the Ig Nobel Prize laureates elected?

**Roth:** In contrast to the original Nobel Prize, nominations for the Ig prize can be made by anyone and even self-nominations are possible. Marc Abrahams and his team get about 9000 nominations per year. The new winners in 10 disciplines are then selected by a Board of Governors. The Board is composed of scientists (including several Ig Nobel Prize winners and several Nobel Prize winners), science writers, and other individuals of greater or lesser eminence.

**JUnQ:** In which journals has Ig Nobel Prize-honored research been published?

**Roth:** In all kinds of journals, from the most obscure to first class. For instance, the most recent winners of the Ig Nobel prize in chemistry published their awarded results in the prestigious European Journal of Chemical Biology, Synthetic Biology & Bionanotechnology (CHEMBIOCHEM). In a paper “Shear-Stress-Mediated Refolding of Proteins from Aggregates and Inclusion Bodies”,<sup>[2]</sup> the researchers reported a method to refold boiled hen egg white lysozyme by applying shear stress in thin fluid films. Miraculously, the Board misinterpreted the study as a method to “partially un-boil an egg.” Anyway, Greg Weiss’s group attended the ceremony.

**JUnQ:** Are Ig Nobel laureates proud of their prize?

**Roth:** The best answer to this question is: it depends. The Anglo-Saxon sense of humor is not for everybody. Most winners have shown up and given a presentation speech. But in some cases, I think nobody really expected that winners would come. One example would be Yuri Struchkov, the director of the Institute of Organoelemental Compounds in Moscow. He was the winner of the 1992 Ig Nobel Prize in literature, for publishing 948 scientific papers between 1981 and 1990, averaging two papers per week over a decade. You would not expect that he would attend the ceremony. But again, proud winners do and they have a good time.

**JUnQ:** Does the Ig Nobel Prize ridicule science?

**Roth:** Not at all. I mean, scientists are normal humans and many of us have a good sense of humor. To make people laugh is not a sin. Good scientific work can be odd or funny, bad science, too. Let me give you an example. In 2013 a Japanese group won the Ig Nobel Prize in Chemistry for answering the question, why we cry when cutting fresh onions. This is fun but also good science. The Board of Governors never comment as to which prize-winning achievement might be deemed “good” or “bad” or “important” or “trivial”. In that particular case, the science was excellent and the whole Japanese group attended the ceremony and brought with them a lot of onions.<sup>[3]</sup>

**JUnQ:** What is the procedure of the award show? Does the audience really throw paper planes at the laureate during the ceremony?

**Roth:** Oh yes! The audience throws paper planes throughout the whole event onto the stage. And the paper planes are thrown back from the stage by real Nobel laureates. During the prize ceremony Ig Nobel laureates are given only 60 seconds to explain what they did and why they did it. In addition, each year, some of the world’s top thinkers are invited to give a so-called 24/7 lecture. The speaker has to explain his or her topic twice: First, a complete, technical description in 24 seconds and then, a clear summary that anyone can understand in 7 words. You should try this out with your own research.

**JUnQ:** The Ig Nobel Prize has been awarded since 1991. Why is the prize almost unknown in Europe?

**Roth:** It is not unknown in Europe. In 2016, there will be again an Ig Nobel Eurotour with Marc Abrahams and several Ig Nobel prize winners and they will have shows in Denmark, Sweden, and the UK. As I said before, it’s

all based on a special Anglo-Saxon humor. I mean not everybody, for instance, in Germany likes Monthly Python’s “Life of Brian” with all those vulgar jokes and wicked, low down, and bitter humor.

**JUnQ:** Would you be proud to be nominated or even elected for the Ig Nobel Prize? Have you ever thought about doing research in that direction?

**Roth:** Yes, of course, and I would be very proud to receive such an honor. But my life is filled with many other things and time flies. But I must admit that I have a wonderful project in mind, which would fulfill all expectations of the Ig Nobel Prize, but I am keeping it a secret.

**JUnQ:** The list of Ig Nobel laureates<sup>1</sup> and of most modern Nobel Prize laureates<sup>2</sup> appears to have orientated in the applied sciences. This is in contrast to the Nobel Prizes 100 years ago, which focused on fundamental research. Can you give an explanation for that?

**Roth:** As far as I remember, Alfred Nobel declared in his last will that the prize should go to the person that made the most important ‘discovery’ or ‘invention’ within physics and to the person who made the most important chemical discovery or improvement. To be honest, I have difficulties to differentiate between scientific discovery, invention, or improvement. Look, the “discovery” or “invention” of Magnetic Resonance Imaging (MRI) was mainly developed by Paul Lauterbur, a chemist, and Peter Mansfield, a physicist. Both got the 2004 Nobel Prize in Physiology and Medicine! When they did their experiments, they had no clue that someday hundreds of millions of people would profit from this powerful diagnostic tool. Of course, neither Higg’s prediction nor the recent experimental detection of the Higgs Particle has changed our daily life. But it is an intellectual step forward in our understanding of the world in which we live. Isn’t that also a benefit to mankind?

**JUnQ:** How great is the importance of fundamental research today? Is there a limit of fundamentals in natural science?

**Roth:** Basic research is the *sine qua non* for any progress in the natural sciences, medicine, and all engineering disciplines. There are endless fundamentals. Only our limited fantasy defines the limits of our horizons.

**JUnQ:** Does basic science appear less important in order to solve social and technical problems like, e.g., energy saving or overpopulation?

**Roth:** No, no! It is true that we cannot solve social prob-

<sup>1</sup>1991, Robert Klark Graham (biology): development of a seed bank just for Nobelists and Olympic athletes. 1991, Alan Kligerman (medicine): development of anti-gas liquids (Beano<sup>®</sup>) against flatulence. 2015, Bruno Grossi, Omar Larach, Mauricio Canals, Rodrigo A. Vasquez, and Jose Iriarte-Diaz (biology): chicken walk like dinosaurs if there is a heavy stick attached to their bottom.

<sup>2</sup>1901, Jacobus Henricus van’t Hoff (chemistry): discovery of the laws for chemical dynamics and osmotic pressure. 2014, Eric Bertig, Stefan Hell, William Moerner (chemistry): development of the STED microscope. 1901, Wilhelm Conrad Röntgen (physics): discovery of X-rays. 2014, Isamu Akasaki, Hiroshi Amano, Shuji Nakamura (physics): invention of blue-light emitting diodes for energy efficient light sources.

lems alone with technology. But again, technology based on fundamental research is an absolute requirement for solving social problems. Technology delivers the necessary tools. The Nobel Prize in Physics 2014 was given to three Japanese scientists, I. Akasaki, H. Amano, and S. Nakamura, who developed, in a mixture of fundamental and applied research, the blue LEDs based on the difficult-to-handle semiconductor gallium nitride. We see the corresponding products already in our supermarkets and can use them for saving energy. Overpopulation is a very complex subject. But natural sciences have already developed some tools, like contraceptive pills and other methods of birth control. These tools are neither perfect nor can they solve this problem alone. Religious, social, and ethical obstacles must be overcome. But this requires an agreement of

many societies in various and very different cultural environments. Again, science cannot solve all our problems, but we cannot solve any problem without it.

**JUnQ:** Thank you very much for the interview!

—Tatjana Dänzer and Andreas Neidlinger

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- [3] K. Roth, *Chem. unserer Zeit*, **2013**, *47*, 382–388.