



# Dear Eva, Dear George,

**180 Years and Beyond  
In Honour of George and Eva Klein**

**with George Klein's two last posthumous  
essays "Hoppet" and "Dekadens"  
and Eva Klein's "Eva stiger över graven"**



# **Dear Eva, Dear George, 180 Years and Beyond**



**In Honour of  
George and Eva Klein**

Stockholm 2022

© The Authors and George and Eva Klein Foundation

ISBN 978-91-639-7389-5 Anahit AB

Layout: Sara Henriksson

Tryck: Universitetsservice AB, Stockholm

# Contents

Contents 5

Preface 8

Acknowledgements 9

## I. The Essays by Eva, Georg and Martin Kaunitz

*Tal till Georg Klein när han fick Bonniers essäpris 2016 för boken "Resistans"*  
av Martin Kaunitz 12

*Hoppet*  
av Georg Klein 14

*Dekadens*  
av Georg Klein 21

*Eva stiger över graven*  
av Eva Klein 36

## II. The 90th Anniversary 2015. 90 + 90 = 180 years

Familjesidan DN 28 juli 2015 42

Per-Magnus Johansson 43

Suzanne Cory 44

Harald zur Hausen 46

A Note to George and Eva Klein on the occasion of their  
significant milestone birthdays from Bob Weinberg 48

Robert Gallo 49

Helli and Walter Doerfler 51

*Dear Eva and George* by Michael and Nitza Steinitz 52

Leonard Pershing Guarente 53

Photos from the 180-year celebration in 2015 54

### III. George in memoriam

George Klein (1925 - 2016) by Ingemar Ernberg, Klas Kärre, Hans Wigzell  
Reprinted from Nature. 2017 Feb 15;542(7641):296. 70

### IV. Personal memories and letters

*Så var min Georg Klein* by Hans Wigzell 74

*Dear Eva, dear George, My dear Supervisors once upon a time!* by Eva Maria Fenyö 77

Alf Svensson 79

Klas Kärre 80

Svante Pääbo 84

Håkan Lindgren 85

*Bridging the Unbridgeable* by Bo Göranzon 87

*Dedicated to all victims of persecution and to the memory of the late Prof. George Klein*  
by Pankaj Trivedi 88

Bosse Lindquist 89

*George - Surprises and the little flower* by Ingemar Ernberg 91

Marie Classon 93

Klas G. Wiman 94

Rikard Erlandsson 95

*Journeys together with George Klein* by Marie Arsenian-Henriksson 96

*Tumorbiology revisited* by Håkan Axelson 99

*One last Friday letter* by Maria Teresa Bejarano 100

George's gravitas by Pedro Otavio de Campos-Lima 102

*From molecule to political science - to the memory of my supervisor Georg Klein*  
by Charlotte Asker-Hagelberg 104

*Neighbor activation* by Juha Klefström 106

*Memorial - George Klein* by Maria Anvret 108

Birgitta Åsjö 109

Warren S. Pear 111

Elena Kashuba 112

*George Klein in three languages* by Eitan Yefenof 113

*How "Tumor Biology West" started. History of the great influence of George Klein and the Tumor Biology Institute on the Department of Pathology and Microbiology at the University of Nebraska Medical Center* by Donald R. Johnson and Janos Sumegi 114

Barbro Ehlin Henriksson 118

*Poste restante* by Pierre Åman 120

Hans-Gustaf Ljunggren 122

*Political influences on the content and pursuit of science in dictatorship and democracy* by Alexander von Gabain 123

Sigurbjörg Þorsteinsdóttir 141

*A tribute for George and Eva Klein* by Shuguang Zhang 142

# Shuguang Zhang

*Shuguang Zhang is leading a group at the Laboratory of Molecular Architecture in the Media Lab, Massachusetts Institute of Technology. He received his B.S from Sichuan University, China and Ph.D. in Biochemistry & Molecular Biology from University of California at Santa Barbara, USA. His work on designer self-assembling peptide scaffolds won a 2004 R&D 100 award. He is a co-founder and board member of the Molecular Frontiers Foundation that encourages young people to ask the best questions in order to win the Molecular Frontiers Inquiry Prize. Shuguang Zhang made a serendipitous discovery of a repetitive and ionic self-complementary peptide segment in yeast protein Zuotin in 1990. This is the discovery of the first self-assembling peptides that eventually led to the development of a new field of peptide nanobiotechnology. Shuguang Zhang in 2011 invented a simple molecular QTY Code to engineer proteins, particularly membrane proteins and perhaps other aggregated proteins. Not only do these engineered membrane receptor proteins become water-soluble with little change in molecular weight and pI, but these detergent-free (water-soluble) membrane proteins also retain their biological function, namely bind their natural ligands. He has been a close colleague and friend of George and Eva Klein over two decades. Email: Shuguang@MIT.EDU, Tel: +1-617-258-7514*

## **A tribute for George and Eva Klein**

Professor George and Professor Eva Klein have inspired multiple generations of leading biomedical researchers, leaving their influence on tumor and cancer biology, immunology and virology around the world. They personally taught and mentored a large number of influential biomedical researchers and medical scientists at their home institution, the Karolinska Institute, elsewhere in Europe and in the rest of world. Their pioneering research, either intentionally pursued or quickly recognized following unexpected discoveries, has had a profound impact beyond their own fields. Because of their warm and open personalities, their tireless traveling, their keen interest in science, medicine and culture, as well as their intolerance for fools, their names are synonymous with extremely high scientific standards. Their wide spectrum of friends extended beyond any geographic location, from Europe to the Middle East, North and South America, and China. Their names are legendary and their legacy will have a lasting impact for many generations of scientists to come.

One might wonder, how could a young researcher from China, outside of tumor and cancer biology, immunology and virology become very close to George and Eva Klein and stay in their home many times? The answer lies, not surprisingly, in their warm and open-minded personalities. Here is a moving story that illustrates personality of George and Eva Klein.

When I was a graduate student studying *Tetrahymena* genetics at University of California, Santa Barbara in 1987, I had never heard of George or Eva Klein. Although I read literature widely, my own interest was in the detailed structure of DNA, particularly, the left-handed Z-DNA discovered by Alexander Rich and his colleagues at MIT in 1979. My interest was not only a scientific one but also a philosophic one. I asked why does nature sometimes have remarkable symmetry and sometimes not? Why are most helices at molecular scales, for example, alpha-helix in proteins, DNA and RNA double helix in nucleic acids and some helices in polysaccharides and cellulose, right-handed?

My exposure to virology and immunology was minimal although I took two courses in these subjects. But in both courses, the complex names, both in English and non-English, as well as the endless abbreviated terms, Latin names and hard-to-remember acronyms made these subjects less attractive since I was still struggling with English.

Then things changed dramatically in September 1987, when my son, Niklas, then just 3 years old, was diagnosed with childhood acute lymphoblast leukemia (ALL), with ~68% leukemic cells with double chromosomal translocations (7:9; 6:21) in his bone marrow. The doctors at several oncology clinics and at the Children's Hospital of Los Angeles refused to give a prognosis. This was devastating. I immediately sought to read the latest literature about chromosomal translocations and their relationship in childhood leukemia. George Klein's name came up many times. At that time, I had never read nor heard George Klein's name before, and had no idea that he was one of the most prominent tumor and cancer biologists, and a world authority on chromosomal translocation. I wrote him asking for help on what was the best available treatment at that time. I wrote, with my difficult English, to about 30 people who seemed to be experts on childhood leukemia.

Not surprisingly, most people did not reply. Only three people replied to a totally unknown Chinese student, pleading for help. Among them: Sharon Murphy, then at St. Jude Hospital, Janet Rowley of the University of Chicago, and George Klein of the Karolinska Institute, Sweden. George Klein not only wrote me a letter, but he also sent me a large package of his publications relevant to chromosomal translocation and tumor biology. George probably soon forgot my request since he routinely replied to such requests, large and small, but it is one I will never forget. This was my first encounter with George Klein, not as a scientist, but as a father trying to find the cause and cure for my son's mysterious disease.

Many years later, in September 1999, I visited the Karolinska Institute for the first time to attend Dr. Bian Zhao's Ph.D. thesis defense. There I met George Klein in person for the first time. I had no formal appointment with him, nor did I telephone him in advance. I just walked into his office where he was very busy. However, he received me cordially and we had a nice conversation. He not only signed his book, *The Atheist and the Holy City*, but he also gave me another of his books, *Living Now*. He was very generous with his time and very kind to a young stranger.

During our meeting, I invited George Klein to give a History of Biology Lecture at Massachusetts Institute of Technology in September 2000. When I asked George to give me a title for his lecture, he gave me not one, but four titles! He came together with his son Dr. Peter Klein, a mathematician with a Ph.D. from Columbia University, New York. Peter was then interested in complex problems involving mathematics in biology. George not only met his old friends but also made new friends during his visit at MIT. I soon had many visits with Peter Klein in his home and elsewhere since his daughter and son are about the same age as my son, Niklas.



I first met Eva Klein in Peter's house in November 2002. Eva in her usual open-minded, direct and warm manner immediately told me that I was now an honorary member of her family since I am the same age as Peter Klein. I was very honored. During conversation, I learnt that Eva was the person who, together with her postdoctoral associate, discovered the now extremely important and ubiquitous "Natural Killer" cells, a crucial advancement for immunology and tumor biology. I asked her why she gave this name, "Natural Killer" cells. She explained that these cells were discovered from the control experiments. Since these cells can be activated without external stimuli, they are natural killers. Since this discovery was mostly either taken for granted or totally forgotten, I decided to invite Eva Klein to give a talk on the subject to inspire young researchers to make more discoveries, to do good controls, to make very careful observations and to question unexpected results. I arranged for Eva Klein to give the same History of Biology Lecture Series at MIT on 24 March 2003. She gave me a very unusual title: Natural Killer cells: An unexpected discovery (met first as an annoying phenomenon). Her lecture was very well received. Robert Horvitz, Richard Hynes, Jack Buchanan, Gobind Khorana, Boris Magasanik and many other faculty and students in MIT Biology Department and elsewhere attended her lecture, full of interesting stories and information on the current advances in NK cells. She later told me that my request that she give a lecture on the history of the discovery of NK cells encouraged her to look into this active field much more closely.

Although their research area was primarily in tumor and cancer biology, virology and immunology, they both recognized the importance of new findings outside their fields immediately. After I gave a lecture, "Beyond the Petri Dish" hosted by their late colleague and friend structural biologist Carl Brändén at the Karolinska Institute in April 2003, Eva immediately asked me to edit a special focus volume for Seminar on Cancer Biology on 3-dimensional cell culture. The issue came out in October 2005. George, likewise, suggested many experiments to study cancers in the designer biological scaffolds in 3D tissue culture systems.

Both George and Eva Klein had very little patience with or tolerance for fools. They were outspoken on many issues in science, culture and politics. George wrote many books that are utterly refreshing. The ideas expressed and topics selected in his books are direct, sharp, intelligent, lucid and eloquent. Interestingly, he does not per se write the books, rather, he dictates them, a special ability. Eva and George invited me to stay in their home many times during early 2000s, I found one early morning, George was busy dictating another book about 6 o'clock.

Both George and Eva survived the terrible holocaust. Consequently, they knew their time was a gift, not to be wasted on unimportant things. They were extraordinary people, both as scientists and as humanists. They always asked vital questions in medical science and other matters they considered important. They made enormous contributions not only to biomedical research, but also to the enrichment of our culture and politics. They were truly rare world-class citizens.



*2005 gathering to celebrate 80+80 Eva and George Klein's birthdays. Nobel laureates D. Carleton Gajdusek '76 (front row first from left), David Baltimore '75 (front row second from left), future Nobel laureate Harald zur Hausen '08 (front row 7<sup>th</sup> from left, next to Eva Klein). Photo: S. Zhang*



*George Klein and Douglas Hanahan in 2005. Photo: S. Zhang*



*Eva Klein in front of MTC at KI, where she spent her entire working life over 60 years. Photo: S. Zhang*



*George Klein talks with 1976 Nobel laureate D. Carleton Gajdusek in 2005. George was a central medical researcher who recognized very early Gajdusek's unconventional research to discover the cause of Kuru infected people in New Guinea before the 1950s. Photo: S. Zhang*



*3 June 2009 in George's Office. I first met George in his office in September 1999 after corresponding with him in 1987. He was always inquisitive, and asked insightful questions covering all kinds of things.*

*Photo: S. Zhang*



*Visiting Eva Klein on 26 May 2011. I first met Eva Klein in 2002. She was always very open-minded and never stopped asking questions. She told me the story how the Natural Killer cell was named. It was the control experiments that they showed that a particular class of T cells does not need external stimulation to take immune action. Photo: S. Zhang*



Georg and Eva Klein's foundation (GEKS) supports research in the spirit of Eva and George, in particular young scientists. Both small and large donations are welcome by using the bank account: 5414 - 4670 (bankgiro) or bank account: 6134 - 382 501 268 (SHB Vanadisplan) or Swish to (123 597 86 14)

The  
Georg  
and Eva  
Klein  
Foundation

