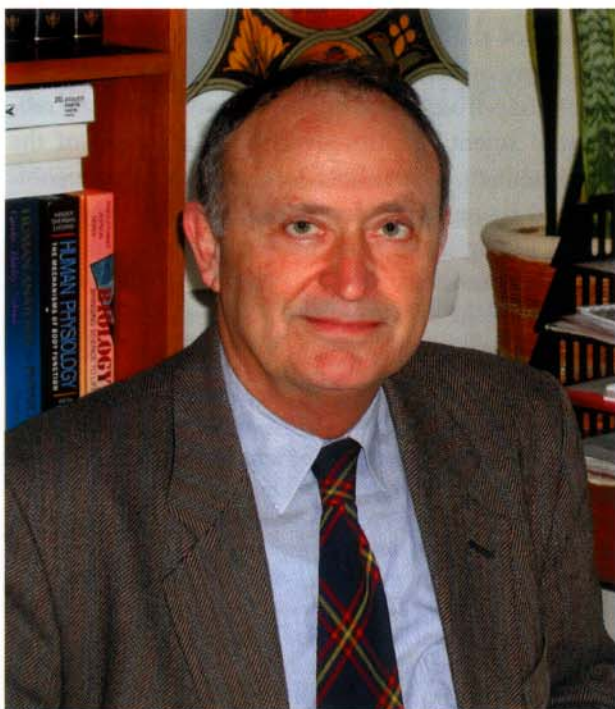


Professor Václav Pačes Celebrates His 60th Birthday

From Bacteriophage Genome Sequencing to Integrated Genomics



I was really surprised to learn that Václav Pačes will soon celebrate his sixtieth birthday. By his personal drive and dynamic energy he easily outshines many of his younger scientific colleagues.

Václav Pačes graduated in biochemistry at the Faculty of Science, Charles University, Prague, in 1965. He received his PhD training at the Institute of Organic Chemistry and Biochemistry of the Czechoslovak Academy of Sciences, where he studied mechanisms of the action of 5-azacytidine on nucleic acids and protein synthesis in *Escherichia coli*. These elegant studies brought basic information on the biological effects of this compound, which later became an important tool in DNA methylation research. During his postdoctoral stay at the McMaster University in Hamilton, Ontario, he became interested in the metabolism of plant hormones – cytokinins – and discovered an enzyme activity specific for the cytokinin catabolism in tobacco cells. This work was of basic importance for further studies on cytokinin metabolism. The enzyme, later named cytokinin oxidase, irreversibly inactivates cytokinins, thus controlling their levels in plant tissues.

After returning to Prague, Václav Pačes continued his research first at the Institute of Organic Chemistry and Biochemistry, and later in the newly founded Institute of Molecular Genetics of the

Czechoslovak Academy of Sciences. It was at this Institute in the late 70's, when he turned his interest on the then recently invented methods of DNA sequencing. In fact, Václav Pačes was the first person to introduce DNA sequencing methods in the former Czechoslovakia. He also soon realized the advantages of the dideoxy-sequencing method when combined with the single-stranded templates produced via DNA fragment cloning in phage M13-based vectors. He applied this new technique to sequencing of the whole genome of bacteriophage PZA, a close relative of the phage ϕ 29 infecting *Bacillus subtilis* cells. Only few completely sequenced viral genomes were available in the mid 80's, when the full-length PZA genomic sequence was determined in his laboratory. Later on, the Pačes' laboratory sequenced the DNAs of several other ϕ 29-family members, including a large part of the ϕ 29 genome itself, and performed a molecular evolutionary analysis of these phages bearing a linear genome with covalently end-attached protein.

I joined Václav Pačes' group in the early 80's for my PhD studies. It was my first experience in a real molecular genetics laboratory and I shall never forget those inimitable times. Besides the above pioneering work on phage genome sequencing, Václav Pačes, his students and young colleagues also pursued several other projects. New methods for *in vitro* gene assembly from synthetic oligonucleotides were then developed. In this way, the synthetic genes for the proenkephalin analogue and cow colostrum trypsin inhibitor were cloned and expressed in *E. coli* cells. Another focus was the study of regulation of gene expression using both *in vitro* and *in vivo* approaches.

With the advent of automated sequencing methods in the late 80's Václav Pačes' research focus shifted to large-scale DNA sequencing and genome analysis projects. During the past decade, he participated in several international projects on sequencing genomes of the bovine herpesvirus, purple non-sulphur bacterium *Rhodobacter capsulatus*, and yeast *Saccharomyces cerevisiae*. These studies evoked formation of a bioinformatics unit within Václav Pačes' department, which gradually became a pivotal element in genome-scale data analysis. The most recent outcome of bioinformatics studies is construction of the database of human endogenous retroviruses, in collaboration with the Cellular and Viral Genetics Group at the Institute, which is accessible to the scientific community via the World Wide Web.

In addition to his basic research work, Václav Pačes also finds time to serve in a respectful number of posts and tasks in organizing and representing Czech Republic science. He was Vice-President of the Academy of Sciences of the Czech Republic (1994–1997). At present, he is Director of the Institute of Molecular Genetics, President of the Czech Society for Biochemistry and Molecular Biology, and member of several science councils at Czech universities, research institutes and ministries. Václav Pačes is also the main organizer and head of the recently established Center for Integrated Genomics, which is comprised of several leading laboratories in the Czech Republic. The aim of this project is to establish a basis for the complex study of genomes in the Czech Republic.

The scientific achievements of Václav Pačes were recognized with several prizes for science, he is also an elected member of EMBO, Vice-President of EMBC, elected member and currently Vice-President of the Learned Society of the Czech Republic, and

elected member of the European Academy of Sciences and Arts.

Václav Pačes is a dedicated teacher. For many years, he has been associated with the Institute of Chemical Technology in Prague, where he started courses of molecular biology and genetic engineering. Many of his students, who first learned molecular biology from attending his lectures, are now recognized scientists. Moreover, he is also one of the best scientists who is able to convey relatively complicated issues of modern biology to the public. He enjoys giving lectures to the general public and high school students.

I would like to take this opportunity to wish Václav Pačes a lot of energy, enthusiasm, personal satisfaction and many more really successful years in continuation of his way from simple bacteriophage genomes to the horizons of contemporary genomic biology.

Pavel Urbánek