Resume of Dr. Savva Geo. Anastasiadis

Assistant Professor Savvas Geo. Anastasiadis

Ass. Prof. Dr. Savas G. Anastassiadis

Institute of Biotechnology Pythia (Founder, Owner, Greece and Bulgaria)

Department of Environmental Engineering, DUTH (Assistant Professor, University of Athens, Xanthi)

Department of Microbiology of the Russian Academy of Sciences (Visiting Professor)

Establishment of a branch of the Pythia Institute of Biotechnology - Slave, Sandanski Region, Bulgaria (November 2013) and Start of production at the branch (Slave, Bulgaria)

Purpose: Development of new technologies in Biotechnology and Industrial Microbiology

EcoPlant Land Improvement Plant Establishment (Slave, Sandanski Region, Bulgaria, 2013)

Studies and scientific experience

10/2000 to date

Research (completing many theses) and teaching (Conventions, Lecturer and Assistant Professor at present (School of Engineering, Xanthi, Greece).

Scientific adviser to the Greek government (unpaid) during the EU presidency.

2003 - Establishment of a personal business called "Research in Biotechnology".

Founder and owner of the Research Institute of Biotechnology Institute Pythia (buildings of the former Avgi Elementary School (Thessaloniki, Greece) - Research and development activities and pilot production of biotechnology products, such as:

• Discovery, production and distribution of the pioneering ice-protection microbial source EcoPlant, which has been used successfully throughout Greece and other countries (Bulgaria, the Netherlands, China, etc.).

• Isolation of microorganisms from natural environments for biotechnological applications

• Future industrial production of other biotech products, e.g. lysine, citric acid, gluconic acid, bioethanol etc. (Bulgaria)

• Production of biomass and production of cellulose of microbial origin from atmospheric carbon dioxide. Discovering microbial cellulose production from atmospheric carbon dioxide (greenhouse effect)

• Isolation of Microorganisms and Production of Various Useful Cellulose Products by Microorganisms (Fermentation)

• Production of by-products from the sugar industry (eg molasses) and biodiesel (eg glycerin)

• Understanding the topic of cancer and the importance of microbiology

• Many other applications

• Accelerate and increase meat production and increase milk production

Pythia Institute of Biotechnology in Bulgaria (Three-storey buildings, SKLAVE, Sandanski District) and the Biotechnology Product Distribution Company (EcoPlant etc.) Production and distribution plant (Bulgaria).

2013 - Establishment of a production unit at the Pythia Institute of Biotechnology in Sofia (Bulgaria) and teaching in the country's intellectual institutions (support from national agents).

2005 - Today - Multi-year research and development cooperation and publication of papers with the Institute of Biochemistry and Physiology of the Russian Academy of Sciences (Dr. Igor Morgunov, Pushchino, Moscow region, Russia).

Supervisor of undergraduate and doctoral students as a visiting professor at the Institute of Biochemistry and Physiology of the Microorganisms of the Russian Academy of Sciences (Pushchino, Moscow region, Russia).

01/2000 - 07/2000 - Military service in the Greek army (Poros and Salamis Naval Hospital, NMS)

10/1998 - 10/1999 - Postdoctoral Research Fellow at Tufts University Biotechnology Center (USA) (Postdoctoral Research Associate)

09/1996 - 12/1998 - Senior Scientist at Cargill (Minneapolis, USA) and ThermoFibergen (ThermoElectron) (Boston, USA)

03/1994 - 08/1996 - Postdoctoral Research Associate at Massachusetts Institute of Technology (MIT), Department of Chemical Engineering (Boston, USA)

Supervisor Academic: Bayer University Professor Gregory Stefanopoulos (MIT, USA) - (Academic advisor: Bayer Professor Dr. Gregory Stephanopoulos)

01/1990 - 04/1994 - Doctoral Thesis (Dr. Nat. Sc., Ph.D. Thesis): Institute of Biotechnology, Jülich Research Center (RCJ), Germany (former Jülich Center for Nuclear Research, KFA, Germany) and Münster University , Germany (Institute of Microbiology)

Subject of the doctoral thesis: "Continuous production of citric acid and gluconic acid with yeast and yeast microorganisms"

Academic Supervisors

Prof. Dr. Hans-Jürgen Rehm (University of Münster, Germany)

Prof. Dr. Christian Wandrey (University of Bonn, Germany and Jülich Research Center)

The doctoral thesis was funded by Haarmann & Reimer, a subsidiary of Bayer, Leverkusen, Germany.

1988 - 1989 - Master's thesis: "Microbial events in the hydration of soybean" Institute of Molecular Microbiology and Biotechnology (former Institute of Microbiology), University of Münster, Germany

Supervisor Academician: Prof. Dr. Hans-Jürgen Rehm

1982 - 1988 - MA in Biology (Diploma), University of Münster, Germany

Main branch: Microbiology

Secondary branch: Biochemistry and molecular and general biology

1981 - 1982 Young Münster College, Germany

1973 - 1979 Sohou High School, Thessaloniki, Greece

1967 - 1973 Elementary School (Dawn and Thessaloniki, Greece) Music composer internationally Achievements in humanity over the last 100 years in the field of microbial production of biotech products through continuous process fermentation (eg 250 g / l citric acid, 450 -500 g / l gluconic acid etc.)

Writing many scientific articles (5-6) in preparation on issues of geopolitical and socio-economic importance for the historical and future evolution of biotechnology, coal and biofuels 1st, 2nd and 3rd generation (2014).

Biographical data and scientific developments

My background is in classical, technical and industrial microbiology, bioengineering and biotechnology as well; with a specific specialization and extensive experiences in fermentation process development and optimization, fermentation technology and microbial screening.

During my doctoral and postdoctoral research works, I developed and optimized new superior fermentation processes for the continuous and semicontinuous production of citric and gluconic acid, lactic acid and the essential amino acid L-lysine. 500 g/l of gluconic acid were produced by isolated yeast-like microorganisms (in fed batch) and 420 g/l continuously. More than 240 g/l of citric acid (in repeated fed batch by yeast strains of*Yarrowia lipolytica*) and 200 g/l continuously, 120-150 g/l lactic acid and 70-90 g/l of L-lysine (in chemostat by strains of *Brevibacterium lactofermentum*) were produced continuously at short fermentation and residence times (chemostat) in a short period of research time. More than 170 g/l of citric acid and 370 g/l of gluconic acid were produced continuously in chemostat fermentations. ATCC (American Type Culture Collection) or isolated strains were used (6 patents). I would also like to inform you that up to this time there aren't any better results in (scientific) fermentation process development and optimization. The above processes have many advantages compared with the traditional industrial processes of the last 100 years. The patent rights (including 2 US patents) have been transferred to me by Research Center. I achieved more than 110 g/l of L-lactic acid in continuous cultures (ran more than 9 months) using non-lactic acid bacteria. One of my future objectives is to achieve more than 220 g/l citric acid, more than 130 g/l L-lysine and more than 150 g/l L-lactic acid in continuous chemostat fermentations.

I obtained my M.S. degree (grade excellent, 1+) from the University of Münster (**Germany**) under the supervision of Professor Dr. H.-J. Rehm (one of the pioneers in industrial microbiology and biotechnology). Subsequently, I undertook my doctoral research under the joint supervision of Professor Dr. H.-J. Rehm of University of Münster and of Professor Dr. Christian Wandrey (one of the fathers of modern biotechnology) at the Biotechnology Institute within the Research Center Jülich in Germany (formerly known as Nuclear Research Center, KFA). Following the completion of my Ph.D., I worked for two and a half years as Postdoctoral Research Associate at the Metabolic Engineering group of Bayer Professor Gregory Stephanopoulos at the Chemical Engineering Department of **M.I.T.** (Boston, USA) and later for an agency on contract basis at the Research Center of Cargill (Minneapolis, USA). Up to the present, I was working as consultant and researcher at Thermo Fibergen Inc. (Bedford, USA), a **Thermo Electron** company (development of novel processes and products). later on, I joined Tuft University as postdoctoral Research associate with Professor David Kaplan (Boston, USA) and finally I returned to my home

country Greece to serve at the Greek Army (Navy) in 2000 and to continue my international career there (Greece) after 20 years of hard work studies in Germany and USA.

I would like noticeably mention that I financed my studies in Germany by myself, working as musician (Keyboards) at Night clubs. I would like at this point of my carrier to gratefully thank Germany for giving me the opportunity to study there, at the well-known and organized German Universities (Münster) and institutions (Forschungszentrum Jülich).

During the time thereafter, I started teaching and assisting diploma theses at the Environmental Engineering Department in 2000 of the Polytechnic school of Democritus University of Thrace (Xanthi, Greece) as lecturer and nowadays only as assistant professor (after 14 years, still no permanent position). Obviously, other things count more than an international career to get a higher position at Greek universities.

In 2003, I grounded and I operate an International Research center named Pythia Institute of Biotechnology which is located at the empty buildings (no children) of the preliminary school of my small village Avgi (500 citisens), located 40 Km near Thessaloniki (Greece). Pythia Institute of Biotechnology is equipped at international level and standards and has been financed by myself.

Based on Research and Development activities at Pythia Institute of Biotechnology, I started the production of a novel superior soil conditioner at pilot scale production of 10 tons/week of capacity, which has been sold and tested successfully in Greece and other countries (Bulgaria, Holland, China, Turkey, Ukraine etc.) since about 10 years (**Novel conditioner EcoPlant**). I discovered also a new microbial system and a process for the production of strong cellulose based material (like thick paper) from atmospheric carbon dioxide (CO_2), which can be used as alternative carbon source for 2nd generation biofuels and biotechnological fermentation processes (cellulose hydrolysis). Another interesting product developed at Pythia Institute of Biotechnology is a biological product for animal feed supplementation, which would accelerate milk and meat production severally.

Several years ago (2005-2006), I started a very friendly and important Research and Development and publishing cooperation as a visitor professor with the **Institute of Biochemistry and Physiology of Microorganisms** of the world known **Russian Academy of Sciences** (Pushchino, Moscow Region, Russia) with Dr. Igor Morgunov. The cooperation with Russian scientists widened my scientific view and knowledge from western World and institutions enormously.

In August of 2012, I started a subsidiary company for sales and distribution of soil conditioner EcoPlant in Bulgaria, named Pythia Institute of Biotechnology (Sklave, Sandanski, Bulgaria, Vat# BG202174635, current residence). The company received license for the production of **EcoPlant**, for a Research laboratory and the biological EcoPlant and other related products and will start production and an international Research Center in Bulgaria very soon (thankfully, I got Bulgarian residence card and Bulgarian ID). I already had meetings with rectors and professors in Bulgaria and I would continue my scientific career also at Bulgarian Universities and institutions.

During the time of my residence in Greece, I published many scientifically very important review and research articles at international journals in the field of industrial microbiology and biotechnology, also several works with scientists of the Russian Academy of Sciences (Puscino, Moscow region, Russia) and received many international awards and recognitions e.g. Einstein award, Plato award, Archimedes award, 21st century award, Who is Who etc. (IBC England, USA, Russia).

The years of my formal education, in both secondary and post-secondary institutions, and the broad scientific background including biology, classical and technical microbiology, biotechnology, bioengineering and chemical engineering, have given me a great deal of insights into the fields of microbiology and biotechnology. I am confident in my abilities as a researcher in developing and optimizing challenging continuous and batch fermentation processes, including fermentation of rDNA proteins, pharmaceuticals and precursors for the production of plastics and polymers, introducing new fermentation processes using newly isolated or available microorganisms and aiding in the resolution of difficult problems. During the above training, I also have acquired many experiences related to the isolation, cultivation, characterization and screening of fungi, yeasts, and bacteria which can be utilized in the production of various important biochemical compounds such as amino acids, organic acids, proteins, vitamins, pharmaceuticals and other fine chemicals.

Moreover, during my work over the two and a half years at MIT, I have had the opportunity to supervise several undergraduate students for their Bachelor' Thesis as well as several students under the Undergraduate Research Opportunities Program (UROP). While pursuing my Ph.D., I also supervised several students for their diploma theses. Though interactions with students, I developed important skills in communication, teaching, organizing and leading a research group. The requirements of such an advisory role will be invaluable in any future positions I will be undertaking.

I would bring to any department and institution not only my knowledge and expertise but an enthusiasm to accomplish any specific goals the department might have. I believe the most important traits of a dedicated scientist are persistence, hard work, and intellectual honesty and loyalty. I would like to share my expertise with others and be a part of the tradition of institutional organizations, which have a long history of performing important research with integrity.

I appreciate any consideration of cooperation in the immediate future. There is a detailed explanation of my past experiences and relevant skills in the attached resume. I would welcome the opportunity to meet with great scientists and discuss my qualifications for working together at their and my research groups. For any additional information, I would appreciate to feel free to contact me.

Sincerely Yours

Dr. Savas G. Anastassiadis