

From remediation to waste valorisation using biocatalysis: Research activities of Industrial Biotechnology and Biocatalysis Group, NTUA, Greece

Evangelos Topakas

National Technical University of Athens, School of Chemical Engineering, Greece

Biocatalysis is founded on the use of the most efficient catalysts in nature, which are enzymes, and can be defined as the transformation of organic compounds catalyzed either by living cells or by their components. Over the past twenty years, major technological and scientific advances have established Biocatalysis as an environmentally friendly and sustainable alternative to traditional chemical synthesis. The chemo-, regio-, diastereo- and enantio-selectivity of biocatalysts are among the properties that render them superior to chemical catalysts. For promoting a sustainable society and bio-economy, novel biocatalysts need to be discovered for the conversion of residual lignocellulosic biomass into energy, materials and fine chemicals on behalf of the biorefinery concept. Industrial Biotechnology and Biocatalysis (IndBioCat) group is dedicated in the discovery, characterisation, modification and utilisation of novel biocatalysts in various applications, such as in biomass conversion, polymer synthesis and modification, organic synthesis/modification of bioactive compounds, as well as waste valorisation and detoxification of pollutants.

Evangelos Topakas



Contact details: tel +30 210 7723264, email: vtopakas@chemeng.ntua.gr,
Date of Birth: 23rd of October of 1976, Citizenship: Hellenic
Work address: National Technical University of Athens, School of Chemical
Engineering, 5 Iroon Polytechniou Str, Zografou Campus, GR-15780
Marital status: Married with two children

Institution Webpage: http://www.chemeng.ntua.gr/the_people/e.topakas

Personal Webpage: <http://www.chemeng.ntua.gr/indubiocat/index.html>

Linkedin: <http://www.linkedin.com/pub/evangelos-topakas/19/364/741>

ResearchGate: https://www.researchgate.net/profile/Evangelos_Topakas/?ev=hdr_xprf

Google Scholar: <http://scholar.google.gr/citations?user=LWuikOgAAAAJ&hl=en&oi=ao>

Biography

Dr Topakas has a degree in Chemistry (Excellent 8.81/10.0; Aristotle University, Department of Chemistry, Thessaloniki, Greece) and he took his PhD in Industrial Biotechnology in 2004 at National Technical University of Athens (NTUA, Greece). He has worked as a Research Associate in the Institute for Cell and Molecular Biosciences, University of Newcastle upon Tyne and in the Biotechnology Laboratory at NTUA. In 2010, he visited Chalmers University and stayed one month as Visiting Assistant Professor. On January 2012 (appointed on November of 2009), he worked as a Lecturer, while since November 2014 (appointed on April of 2014) he is working as an **Assistant Professor** in the field of **Industrial Biotechnology**, School of Chemical Engineering, Department of Synthesis and Development of Industrial Processes, NTUA. Since March 2015, Dr Topakas is appointed as a **visiting Associate Professor** in the Chemical Engineering Division of the Department of Civil, Environmental and Natural Resources Engineering, Lulea University of Technology, Sweden, expanding his collaboration and experience in North Europe. His research experience includes discovery of novel enzymes (cellulolytic, hemicellulolytic and ligninolytic enzymes) for the enzyme-aided extraction or modification of bioactive components (Biocatalysis in non-conventional media) from biomass using conventional and modern bioinformatics assisted strategies (genome mining of *Fusarium oxysporum* and *Sporotrichum thermophile*), heterologous overexpression (*Pichia pastoris*, *Escherichia coli*) and biochemical characterization of carbohydrate degrading recombinant enzymes, study of the structure/function relationship and regulatory mechanisms of the enzymes induced by saprophytic organisms. Emphasis is given on the utilization of residual biomass for the production of 2nd generation liquid biofuels and high-added value compounds in the field of Biorefineries. His research activities cross the borders of different synergistic disciplines requiring the active participation of engineers, biochemists, molecular biologists and physicists. Dr Topakas is better prepared to overcome challenges with the orchestration of the activities of researchers from different disciplines in order to achieve a common goal. His experience in academia, handling students and supervising very ambitious researchers at the BSc, MSc & PhD level, molded his philosophy that believes in a custom-made policy to suit the specific interest of each researcher. As a senior member of Biotechnology Laboratory and leader of the Industrial Biotechnology and Biocatalysis group (<https://www.chemeng.ntua.gr/indubiocat/>), he has involved in the project for sequence of *S. thermophile* genome in collaboration with the JGI (DOE, USA).

Evangelos Topakas, Assistant Professor, PhD

Dr Topakas has co-authored and participated in 26 National and European Research Programs related to the biotechnological exploitation of biomass and biocatalysts for the production of high-added value compounds and energy. His activity is documented in 108 refereed publications in International Scientific Journals and Book chapters and presented in more than 120 International and National Conferences. According to Scopus and Google Scholar analysis (October 2018), his publications were cited 1983 (h-index 28) and 2738 (h-index 32) times, respectively. There are more than 80 researchers that appear as co-authors in his publication list, which demonstrates Dr Topakas ability to interact successfully with diverse personalities and educational backgrounds.