

# CURRICULUM VITAE - IOANNIS NIKOLAKAKIS

**h-index Scopus 18**  
**Citations Google (1140)**

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## RESEARCH INTERESTS

- Powder processing and Process optimization.
- Pharmaceutical processing  
Capsule filling, Tableting
- Solid-liquid interactions  
Granulation, Extrusion/Spheronisation, Pelletization
- Hot-melt extrusion – Solid dispersions
- Spray drying – Solid dispersions, Compaction
- Biomaterials - Porous systems for controlled delivery
- Nutraceuticals  
Essential oils, Probiotics
- Self-emulsification, Microencapsulation

## MAIN RESEARCH PROGRAMS – COORDINATOR

- Research Program for the Development of Industrial Research and Technology Growth (*NSRF2013*) in collaboration with Pharmaceutical Industry. **Position:** **Coordinator**. Project title: ‘Development of sustained release dosage forms of hygroscopic drugs’(100000EUROS). Patent application pending.
- Research Program *Exostrefia Business Competitiveness (NSRF 2014)A 2013* (ΕΣΠΑ) in collaboration with Pharmaceutical Industry. **Position:** **Coordinator**. Project title: ‘Solid self-emulsifying dosage forms for the improvement of the absorption of poorly water soluble drugs’ (100000EUROS). Patent application pending.
- Research Program for the Development of Human Resources (*IENNEA 2003 – 2008*) Aristotle University of Thessaloniki. **Position:** **Principal investigator**. Project title: ‘Development of multiple-unit systems of pellets for tripartite release of drugs (Stomach, intestine and colon)’
- Research Program Pythagoras I - Aristotle University of Thessaloniki (2004-2006) **Position:** **Collaborator**. Project title: ‘Characterisation of solid drugs and handling of problems of development and therapeutic efficacy of drugs by application of modern analytical methods and crystal engineering.
- International multi-center, phase II study of WHO. The School of Pharmacy, London (1989). **Position:** **Main Investigator**. Project title: ‘Physicochemical studies of levonorgestrel esters and ester oximes and of medroxyprogesterone acetate relative to their pharmaceutical formulation’

## ACADEMIC DISTINCTIONS AND AWARDS

- Member of the Editorial board of Drug Development and Research (Wiley Publishers)
- Member of the Editorial board of the journal 'Processes' (MDPI)
- Honorary Doctor of the Yerevan State Medical University of Armenia (1999).
- External Examiner for the State Scholarship Foundation (IKY) for the award of Scholarships to Pharmacists for the years 2006-2009
- Award to my undergraduate Erasmus student Andrea Salis for his work by the European Committee for Long Life Learning Program, Thessaloniki 14-5-2014
- 1<sup>st</sup> price poster award to my undergraduate student Theodoros Avgerinos for the presentation of his research work 'Combination of diluent and Kollidon polymer for the preparation of slow release matrix tablets of pyridostigmine bromide. 16th Panhellenic Pharmaceutical Conference, Athens, June 2013 (Conference Abstracts PP04010)
- 2<sup>nd</sup> price poster award to my postgraduate (Master's) student Paraskevi Gkogkou for the presentation of her research work 'Development and Optimization of chitosan/microcrystalline cellulose/piroxicam compositions by application of mixture design'. 16th Panhellenic Pharmaceutical Conference, Athens, June 2013 (Conference Abstracts PP04011)
- Excellence awarded to my postgraduate student Ioannis Partheniadis by the Faculty of Health Sciences of the Aristotle University of Thessaloniki for his scientific achievement (2019).

## PUBLICATIONS

**A. Ph.D. Thesis** Chelsea Dept of Pharmacy, King's College, University of London

Title: "The effects of particle shape and particle size on the tensile strengths of powders"

### **B. ARTICLES PUBLISHED IN INTERNATIONAL SCIENTIFIC JOURNALS (asterisk denotes corresponding author)**

- J1. Nikolakakis, I. and Pilpel, N.\* (1985).** 'Effect of particle shape on the tensile strength of powders' Powder Technology, 42, 279-284.
- J2. Nikolakakis, I. and Pilpel, N.\* (1985).** 'Effect of particle size and particle shape on the tensile strength of powders' Powder Technology, 45, 79-94.
- J3. Nikolakakis, I. and Pilpel, N.\* (1988).** 'Effect of particle size and particle shape on the tensile strength of powders' Powder Technology, 56, 95-103.
- J4. Nikolakakis, I. and Newton, J. M.\* (1989)** 'Solid state adsorption of antibiotics onto sorbitol'. Journal of Pharmacy and Pharmacology 41, 145-148.
- J5. Nikolakakis I., Balesteros Aragon O., Malamataris S.\* (1998).** 'Resistance to Densification, Tensile Strength and Capsule-filling Performance of some Pharmaceutical Diluents'. J. Pharm. and Pharmacol. 50, 713-721.

- J6.** Kachrimanis K., **Nikolakakis I.**, Malamataris S.\* (2000). ‘Spherical Crystal Agglomeration of Ibuprofen by the Solvent Change Technique in Presence of Methacrylic Polymers’. *J. Pharm. Sci.* 89(2), 250-259.
- J7.** **Nikolakakis I.\***, Kachrimanis, K., Malamataris, S. (2000). ‘Relations between crystallisation conditions and micromeritic properties of ibuprofen’. *Int. J. Pharm.* 201, 79-88.
- J8.** E. C Rodriguez, J.J. Torrado, **I. Nikolakakis**, S. Torrado, J.L. Lastres, and S. Malamataris S\*. (2001). ‘Micromeritic and Packing Properties of Diclofenac Pellets and Effects of Some Formulation Variables’. *Drug Dev. Ind. Pharm.* 27(8), 847-855.
- J9.** Theodora Kapsidou, **Ioannis Nikolakakis\***, Stavros Malamataris (2001). ‘Agglomeration state and migration of drugs in wet granulations during drying’. *Int. J. Pharm.*, 227, 97-112.
- J10.** Al-Zoubi, N., **Nikolakakis, I.**, Malamataris, S.\* (2002). ‘Crystallisation conditions and formation of orthorhombic paracetamol from ethanolic solution’. *J. Pharm. Pharmacol.* 54, 325-333.
- J11.** **Nikolakakis, I\*.**, Newton, J. M., Malamataris, S., (2002). ‘Solid state ‘adsorption’ of fine antibiotic powders onto sorbitol: effects of particle size, state of sorbed water and surface free energy characteristics’. *European Journal of Pharmaceutical Sciences* 17(4-5) 229-238.
- J12.** Kachrimanis, K., **Nikolakakis, I.**, Malamataris, S\*. (2002). ‘Tensile Strength and Disintegration of Tableted Standard and Silicified Cellulose – Influences of Interparticle Bonding’. *Journal of Pharmaceutical Sciences* 92(7), 1489-1501.
- J13.** Kipouros, K., Kachrimanis, K\*., **Nikolakakis, I.**, Malamataris, S. (2005). ‘Quantitative analysis of less soluble form IV in commercial carbamazepine (form III) by diffuse reflectance fourier transform spectroscopy (DRIFTS) and lazy learning algorithm’. *Analytica Chimica Acta* 550, 191-198.
- J14.** Kipouros, K., Kachrimanis, K\*., **Nikolakakis, I.**, Tserki, V., Malamataris, S. (2006). ‘Simultaneous Quantification of Carbamazepine Crystal Forms in Ternary Mixtures (I, III, and IV) by Diffuse Reflectance FTIR Spectroscopy (DRIFTS) and Multivariate Calibration’. *Journal of Pharmaceutical Sciences* 95 (11), 2419-2431.
- J15.** **Nikolakakis, I.**, Tsarvouli, K., Malamataris, S\*. (2006). ‘Water retention and drainage in different brands of microcrystalline cellulose: Effect of measuring conditions’. *European Journal of Pharmaceutics and Biopharmaceutics* 63, 278-287.
- J16.** Balaxi, M., **Nikolakakis, I.\***, Kachrimanis, K., Malamataris, S. (2009). ‘Combined effects of Wetting, Drying, and Microcrystalline Cellulose Type on the Mechanical Strength and Disintegration of Pellets’. *Journal of Pharmaceutical Sciences* 98, 676-689.
- J17.** Cosijns, A., Nizet, D., **Nikolakakis, I.**, Veraet, S\*., De Beer T., Siepmann, F., Siepmann, J., Evrard, B., and Remon, J.P. (2009). ‘Porous pellets as drug carrier system’. *Drug Development and Industrial Pharmacy* 35(6), 655-662.
- J18.** Balaxi, M., **Nikolakakis, I\***, Malamataris, S. (2010). ‘Preparation of porous microcrystalline cellulose pellets by freeze-drying: Effects of wetting liquid and initial freezing conditions’. *Journal of Pharmaceutical Sciences* 99: 2104-2113

- J19.** Matsaridou, I., Barmpalexis, P., Salis, A., **Nikolakakis, I\***. (2012). ‘The Influence of Surfactant HLB and Oil:Surfactant Ratio on the Formation and Properties of Self-Emulsifying Pellets and Microemulsion Reconstitution’ *AAPS PharmSciTech* vol. 13 (4), 1319 – 1330
- J20.** Djuris, J\*., **Nikolakakis, I.**, Ibric, S., Djuric, Z., Kachrimanis K. (2013). Preparation of carbamazepine-Soluplus solid dispersions by hot-melt extrusion, and prediction of drug-polymer miscibility by thermodynamic model fitting. *European Journal of Pharmaceutics and Biopharmaceutics*. 84(1):228-37.
- J21.** Bounartzi M., Panagopoulou A., Kantiranis, N., Malamataris, S., **Nikolakakis, I.\*** (2014). ‘Effect of plasticizer type on the hot melt extrusion of venlafaxine hydrochloride’ *Journal of Pharmacy and Pharmacology* 66 (2), 297-308
- J22.** Djuris, J.\*, **Nikolakakis, I.**, Ibric, S., Djuric, Z., Kachrimanis K. (2014). ‘Effect of composition in the development of carbamazepine hot-melt extruded solid dispersions by application of mixture experimental design’. *Journal of Pharmacy and Pharmacology* 66 (2), 232-243
- J23.** **Nikolakakis, I\***. Malamataris, S. (2014). ‘Self-emulsifying pellets: Relations between kinetic parameters of drug release and emulsion reconstitution, influence of formulation variables’. *Journal of Pharmaceutical Sciences* 103 (5), 1453-1465
- J24.** **Nikolakakis, I\***, Panagopoulou, Salis A., Malamataris, S. (2015). ‘Self-Emulsifying pellets: Correlations between the characteristics of the pellets and of the emulsions used for their preparation and drug distribution’. *AAPS PharmSciTech*. *AAPS PharmSciTech*, Vol. 16, No. 1 129-139
- J25** **Nikolakakis I.**, Kachrimanis K\* (2017). ‘Crystallisation kinetics of orthorhombic paracetamol from the glassy state studied by nonisothermal DSC. *Drug Development and Industrial Pharmacy*. <http://dx.doi.org/10.1080/03639045.2016.1236810>
- J26** Nizar Al-Zoubi, Faten Odeh, **Ioannis Nikolakakis\*** (2017). Co-spray drying of metformin hydrochloride with polymers to improve compaction behavior. *Powder Technology* 307 (2017) 163–174
- J27** Salis, A., Porcu, E.P., Gavini E., Fois G.R., Cornaglia A.I., Rassu G., Diana M., Maestri M., Giunchedi P\*. & **Nikolakakis I.** (2017). In situ forming biodegradable poly( $\epsilon$ -caprolactone) microsphere systems: a challenge for transarterial embolization therapy. In vitro and preliminary *ex vivo* studies. *Expert Opinion on Drug Delivery* 14(4), pp. 453-465.
- J28** F. Toziopoulou, M. Malamataris, **I. Nikolakakis**, K. Kachrimanis\* (2017). Production of aprepitant nanocrystals by wet media milling and subsequent solidification. *Int J. Pharm.* 2017 Feb 28. doi: 10.1016/j.ijpharm.2017.02.065.
- J29** **Ioannis Nikolakakis\*** and Ioannis Partheniadis 2017. Self-Emulsifying Granules and Pellets: Composition and Formation Mechanisms for Instant or Controlled Release. *Pharmaceutics* 9(4) 50.
- J30** Ioannis Partheniadis, Panagiota Karakasidou, Souzan Vergkizi, **Ioannis Nikolakakis\*** (2017). Spectroscopic examination and release of microencapsulated oregano essential oil *ADMET & DMPK* 5(4) 224-233.
- J31** Theodoros Avgerinos, Nikolaos Kantiranis, Athanasia Panagopoulou, Stavros Malamataris, Kyriakos Kachrimanis and **Ioannis Nikolakakis\*** (2018). Mechanical properties and drug release of venlafaxine HCl solid mini matrices prepared by hot-

- melt extrusion and hot or ambient compression. *Drug Development and Industrial Pharmacy Volume 44, No. 2, 338–348.*
- J32** Peristera-Maria Toziou, Panagiotis Barmplexis, Paraskevi Boukouvala, Susan Verghese, **Ioannis Nikolakakis\*** (2018). Quantification of live *Lactobacillus acidophilus* in mixed populations of live and killed by application of attenuated reflection Fourier transform infrared spectroscopy combined with chemometrics. *Journal of Pharmaceutical and Biomedical Analysis 154, 16–22.*
- J33** Nizar Al-Zoubi, Faten Odeh, Wasfy Obeidat, Ahmad Al-Jaberi, Ioannis Partheniadis and **Ioannis Nikolakakis\*** (2018). Evaluation of spironolactone solid dispersions prepared by co-spray drying with Soluplus<sup>®</sup> and PVP K30 and feasibility of processing into immediate release tablets' *J. Pharm Sci. 2018 Sep;107(9):2385-2398*
- J34** Anna Karagianni, Kyriakos Kachrimanis and **Ioannis Nikolakakis\*** (2018). Co-Amorphous Solid Dispersions for Solubility and Absorption Improvement of Drugs: Composition, Preparation, Characterization and Formulations for Oral Delivery. *Pharmaceutics 2018, 10(3), 98*
- J35** P. Barmplexis\*, A. Karagianni, **I. Nikolakakis**, K. Kachrimanis (2018). Artificial neural networks (ANNs) and partial least squares (PLS) regression in the quantitative analysis of cocrystal formulations by Raman and ATR-FTIR spectroscopy. *Journal of Pharmaceutical and Biomedical Analysis 158, 214–224.*
- J36** P. Barmplexis\*, A. Karagianni, **I. Nikolakakis**, K. Kachrimanis (2018). Preparation of pharmaceutical cocrystal formulations via melt mixing technique: A thermodynamic perspective. *Eur. J. Pharm. and Biopharm. 131, 130–140.*
- J37** I. Partheniadis, S. Vergkizi, D. Lazari, C. Reppas, **I. Nikolakakis\*** (2019). Formulation, characterization and antimicrobial activity of tablets of essential oil prepared by compression of spray-dried powder. *Journal of Drug Delivery Science and Technology 50 (2019) 226–236.*
- J38** I Partheniadis, P. Gkogkou, N. Kantiranis and **I. Nikolakakis\*** (2019). Modulation of the Release of a Non-Interacting Low Solubility Drug from Chitosan Pellets Using Different Pellet Size, Composition and Numerical Optimization. *Pharmaceutics 2019, 11, 175.*
- J39** M. Diril, Y. Karasulu, M. Toskas and **I. Nikolakakis\*** (2019). Development and permeability Testing of Self-Emulsifying Atorvastatin Calcium Pellets and Tablets of Compressed Pellets. *Processes 7, 365; doi:10.3390/pr7060365*
- J40** I. Partheniadis, T. Papanikolaou, M.F. Noisternig, U.J. Griesser, N. Kantiranis, **I. Nikolakakis\***. Structure reinforcement of porous hydroxyapatite pellets using sodium carbonate as sintering aid: Microstructure, secondary phases and mechanical properties. *Adv. Powder Technol. 2019, 30 (8) 1642-1654.*
- J41** Medarević, D., Ibrić, S., Vardaka, E., (...), **Nikolakakis, I.**, Kachrimanis, K. Insight into the formation of glimepiride nanocrystals by wet media milling *Pharmaceutics 2020, 12(1), 53; https://doi.org/10.3390/pharmaceutics12010053*
- J42** Barmplexis, P., Partheniadis, I., Mitra, K.-S., Papadopoulou, L., **Nikolakakis, I.\*** Application of multiple linear regression and artificial neural networks for the prediction of the packing and capsule filling performance of coated and plain pellets differing in density and size (2020) *Pharmaceutics 12(3), 244*

- J43** Partheniadis, I., Karantzalis, A.E., Shah, R.R., Al-Zoubi, N., **Nikolakakis, I.\*** (2020) Influence of compression at elevated temperature on the compactibility of thermo-mechanically processed polymers. *Chemical Engineering Research and Design* 156, pp. 64-75
- J44** Al-Zoubi, N., Ardakani, A., Odeh, F., Partheniadis, I., **Nikolakakis, I.\*** (2020) Mechanical properties of starch esters at particle and compact level - Comparisons and exploration of the applicability of Hiestand's equation to predict tablet strength *European Journal of Pharmaceutical Sciences* 147,105292
- J45** Xing Chen, Ioannis Partheniadis, **Ioannis Nikolakakis\***, Hisham Al-Obaidi (2020) Solubility Improvement of Progesterone from Solid Dispersions Prepared by Solvent Evaporation and Co-milling. *Polymers* 2020, 12(4), 854; <https://doi.org/10.3390/polym12040854>
- J46** Ioannis Partheniadis, **Ioannis Nikolakakis**, Ivo Laidmäe and Jyrki Heinämäki\* (2020) A Mini-Review: Needleless Electrospinning of Nanofibers for Pharmaceutical and Biomedical Applications. *Processes* 2020, 8(6), 673; <https://doi.org/10.3390/pr8060673>
- J47** Partheniadis, I., Zarafidou, E., Litinas, K.E., **Nikolakakis, I.\*** (2020). Enteric release essential oil prepared by co-spray drying methacrylate / polysaccharides - influence of starch type. *Pharmaceutics* 2020, 12, 571; [doi:10.3390/pharmaceutics12060571](https://doi.org/10.3390/pharmaceutics12060571)
- J48** Maria Malamataris\*, Anastasia Charissi, Stavros Malamataris, Kyriakos Kachrimanis and **Nikolakakis, I.** (2020). Spray drying for the preparation of nanoparticle-based drug formulations as dry powders for inhalation. *Processes* 2020, 8, 788; [doi:10.3390/pr8070788](https://doi.org/10.3390/pr8070788).
- J49** Ioannis Partheniadis, Miltiadis Toskas, Filippos-Michail Stavrakas, **Ioannis Nikolakakis\*** (2020) Application of hierarchical cluster analysis for screening unprocessed and hot-melt extruded pharmaceutical polymers with similar particulate and compaction properties *Processes* 2020, 8(10), 1208; <https://doi.org/10.3390/pr8101208>
- J50** Souzan Vergkizi\* and **Ioannis Nikolakakis** (2020). Bacillus Calmette–Guérin (BCG) vaccine generates immunoregulatory cells in the cervical lymph nodes in guinea pigs injected intra dermally *Vaccines* (Elsevier) <https://doi.org/10.1016/j.vaccine.2020.10.009>
- J51** Andreas Ouranidis, Nikos Gkampelis, Elisavet Vardaka, Anna Karagianni, **Ioannis Nikolakakis**, and Kyriakos Kachrimanis\* (2020). Overcoming the solubility barrier of ibuprofen by the rational process design of a nanocrystal formulation *Pharmaceutics* 2020, 12, 969; [doi:10.3390/pharmaceutics12100969](https://doi.org/10.3390/pharmaceutics12100969)
- J52** Nizar Al-Zoubi\*, Faten Odeh, Ioannis Partheniadis, Shadi Gharaibeh, **Ioannis Nikolakakis\*** (2021). Spray drying of naproxen and naproxen sodium for improved tableting - Physicochemical characterization and compression performance. *Pharmaceutical Development and Technology*. <https://doi.org/10.1080/10837450.2020.1853769>
- J53** Ioannis Partheniadis, Rumit Shah, **Ioannis Nikolakakis\*** (2020). Ultrasonic Homogenization Process and Techniques - Perspective in Nanosizing Drugs. *Journal of Dispersion Science and Technology*. <https://doi.org/10.1080/01932691.2021.1878035>

**J54** Nizar Al-Zoubi 1,\*, Shadi Gharaibeh 2 , Ahmad Aljaberi 3 & **Ioannis Nikolakakis** (2021). Spray Drying for Direct Compression of Pharmaceuticals. *Processes* <https://doi.org/10.3390/pr9020267>

**J55** Andreas Ouranidis, Nikos Gkampelis, Catherine Markopoulou, Ioannis Nikolakakis and Kyriakos Kachrimanis. Development of a Nanocrystal Formulation of a Low Melting Point API Following a Quality by Design Approach. *Processes* 2021, 9(6), 954; <https://doi.org/10.3390/pr9060954>

**J56** Ioannis Partheniadis, Despoina Kopanelou, Michael Gamlen and **Ioannis Nikolakakis\*** (2020). In-line monitoring of the weight and axial expansion of pyridostigmine bromide tablets under dynamic vapor sorption and impact of drug deliquescence on tablet strength and release (*Int J Pharm.* under revision)

**J57** Nizar Al-Zoubi, Ioannis Partheniadis, Kyriakos Kachrimanis, **Ioannis Nikolakakis\*** Particle coating via spray drying as an approach for the combination of incompatible drugs (under preparation)

#### **C. PRESENTATIONS IN INTERNATIONAL CONFERENCES**

Number of presentations in international conferences 60.

#### **D. Books**

**B1.** Kyriakos Kachrimanis and **Ioannis Nikolakakis** Title: ‘Polymers as Formulation Excipients for Hot-Melt Extrusion Processing of Pharmaceuticals’ Vijay Kumar Thakur and Manju Kumari Thakur (eds) Published Online: 7 AUG 2015. Wiley Online Library. DOI: 10.1002/9781119041412.

**B2.** Aulton’s *Pharmaceutics The Design and Manufacture of Medicines*. Greek Edition. Greek Edition

#### **E. Patent**

EUROPEAN PATENT APPLICATION EP 3 556 357 A1

Date of publication: 23.10.2019 Bulletin 2019/4. SUSTAINED RELEASE  
PYRIDOSTIGMINE COMPOSITIONS