

# Panagiotis Bilalis

## Curriculum Vitae

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<https://polymer.kaust.edu.sa/Pages/Home.aspx>



### PERSONAL INFORMATION

- **Date of birth:** 26<sup>th</sup> June 1979
- **Nationality:** Greek
- **Marital status:** Married with 2 children
- **Address:** 63 Delfon Str., Glyfada 16561, Greece
- **Phone number:** +306946036006, +966540373298
- **E-mail:** [bilalis.panagiotis@kaust.edu.sa](mailto:bilalis.panagiotis@kaust.edu.sa) , [bilalisp@gmail.com](mailto:bilalisp@gmail.com)

### EDUCATION

- **2005-2008:** Doctor of Philosophy (Ph.D.) in Polymer Science, University of Athens, Greece, under the supervision of Prof. **Nikos Hadjichristidis**.
- **2003-2005:** Master of Science (M.Sc.) in Polymer Science, University of Athens, Greece, under the supervision of Prof. **Nikos Hadjichristidis**.
- **1999-2003:** Bachelor of Science (B.Sc.) in Chemistry, from the University of Patras, Greece.

### SCHOLAR ACTIVITY

- **October 2005- May 2008:** PhD Thesis: "Synthesis and characterization of linear triblock terpolymers". University of Athens, Department of Chemistry, Greece. PI: Prof. **Nikos Hadjichristidis**.
- **October 2003- September 2005:** Master Thesis: "Controlled Radical Polymerization of N-vinyl pyrrolidone. Synthesis of block copolymers". University of Athens, Department of Chemistry, Greece. PI: Prof. **Nikos Hadjichristidis**.
- **September 2002- June 2003:** Diploma Thesis: "Synthesis and characterization of polymers with biostatic properties". University of Patras, Department of Chemistry, Greece. PI: Prof. **I. Kallitsis**.

## ACADEMIC EXPERIENCE

- **December 2015- Now:** Research Scientist at King Abdullah University of Science and Technology (KAUST), Saudi Arabia. KAUST Catalysis Center, Physical Sci. and Eng. Division. Polymer Synthesis Laboratory. PI: Prof. **Nikos Hadjichristidis**
- **January 2013-September 2015:** Post-doctoral Researcher at University of Athens, Chemistry Department. PI: Professor **Hermis Iatrou**, [iatrou@chem.uoa.gr](mailto:iatrou@chem.uoa.gr)
- **May 2009-December 2012:** Post-doctoral Researcher at NCSR Demokritos Research Center, Institute of Nanoscience and Nanotechnology (INN), Greece.

## RESEARCH INTERESTS

- Complex Macromolecular Architectures by Anionic polymerization and controlled Radical polymerization methods.
- Synthesis of Poly(2-oxazoline)s by microwave-assisted Cationic Ring Opening polymerization.
- Synthesis of Well-defined Polypeptides to form hydrogels, micelles, polymersomes and nanogels.
- Synthesis of multi-stimuli (redox, pH, thermo) polymeric nanocarriers for controlled drug release.
- Functionalization of Graphene Oxide with polymers for biological applications.
- Functionalization of Mesoporous Silica Nanoparticles (MSNs) with polymers (“grafting to” or “grafting from” approach) for biological applications.
- Synthesis of magnetic ( $\text{Fe}_3\text{O}_4$ ), silver (Ag), gold (Au) nanoparticles and quantum dots (QDs), for biological applications.

## SCIENTIFIC SKILLS

- **October 2007- December 2007:** PhD visiting student in *Massachusetts Institute of Technology (MIT), Department of Materials Science and Engineering*, PI: Prof. C. A. Ross. Specialized in self-assembly of block copolymers in bulk. Trained in RIE (Reactive Ion Etching) and SEM (Scanning Electron Microscopy).
- Anionic Polymerization and High Vacuum Techniques.
- Scientific glassblowing.
- Controlled Radical polymerization methods (ATRP, NMRP, RAFT)
- Organic synthesis in High Vacuum and in inert atmosphere.

- Chromatography, Spectroscopy and other Analytical methods for polymer characterization (FT-IR, UV, SEC, DLS, LALLS, DSC, TGA).
- Polymer micellization in selective solvents.
- Synthesis of functionalized N-Carboxyanhydrides (NCAs) for Ring Opening Polymerization.

## LANGUAGES

- **GREEK:** Native
- **ENGLISH:** Very Good Spoken and Written

## FUNDED RESEARCH PROJECTS, GRANTS

**2009-2012:** “A Novel Nano-container drug carrier for targeted treatment of prostate cancer”. EU FP7 “IDEAS” grant (reference number 232959) with budget 2.000.000 Euros, (Postdoctoral Fellow NCSR Demokritos).

**2013-2015:** “Synthesis of multifunctional amphiphilic hybrid polypeptides that form smart drug and gene delivery nanoconstructs against pancreatic cancer”. Project co-financed by the European Union (European Social Fund- ESF) and Greek national funds (PANNANOMED/1055) with budget 600.000 Euros, (Postdoctoral Fellow University of Athens).

**2018-2019:** “Novel Thermoplastic Elastomers with Adjustable Mechanical Properties”. KAUST research project with budget 200.000 Dollars, (Research Scientist).

**2018-2019:** “Novel Polyethylene Nanocomposites for Enhanced Mechanical Properties”. KAUST research project with budget 200.000 Dollars, (Research Scientist).

**2018-2020:** “Chemical and structural modification of polymer based binders for improvement of structure and properties of mortar”. Project co-financed by KAUST and DOW Company with budget 900.00 Dollars, (Research Scientist).

## PARTICIPATION IN CONFERENCES

- **6<sup>th</sup> Hellenic Conference on Polymers**, Patra, Greece, 2006 (**poster**).
- **7<sup>th</sup> International Conference on Nanosciences & Nanotechnologies (NN10)**, Thessaloniki, Greece, 2010 (**poster**).

- **XXVI Panhellenic Conference on Solid State Physics & Materials Science**, Ioannina 26 - 29 September 2010, Greece (**poster**).
- **12<sup>o</sup> Conference in Medicinal Chemistry**, Patra, 11-14 April 2011, Greece (**2 posters**).
- **3<sup>rd</sup> IC4N International Conference** "From nanoparticles and nanomaterials to nanodevices and nanosystems". June 26-30, Crete, 2012 (**oral by other**). "*Novel multifunctional microcontainers: synthesis, properties evaluation and in vitro loading and release Daunorubicin tests*". P. Bilalis, E.K. Efthimiadou, A. Chatzipavlidis, N. Boukos and G. C. Kordas.
- **European Summit for Clinical Nanomedicine**, Basel, Switzerland, May 7-9, 2012 (**oral by other**). "*NANOSTRUCTURED POLYMER CONTAINERS FOR MULTIPLE STIMULI DRUG CONTROLLED RELEASE.*" George Kordas, P. Bilalis, E. K. Efthimiadou, L. A. Tziveleka, A. Chatzipavlidis, C. Tapeinos, A. F. Metaxa and G. S. Pappas.
- **22<sup>nd</sup> Annual Meeting of the European Tissue Repair Society**, Athens October 4-5, 2012 (**oral by other**). "*Tailoring Nanostructured Polymer Containers for Multi Stimuli Activated Drug Controlled Release*". G. Kordas, L.A. Tziveleka, E. K. Efthimiadou, P. Bilalis, A. Chatzipavlidis, C. Tapeinos<sup>1</sup>, A.-F. Metaxa, G. S. Pappas.
- **XI International Conference on Nanostructured Materials**, Rhodes 26-31 August, 2012 Greece (**oral by other**). "*MULTIPLE STIMULI-ACTIVATED DRUG CONTROLLED RELEASE OF MAGNETIC POLYMER NANOCONTAINERS: ELUCIDATING THE IDEAL TRIGGERING COMBINATION*". Leto-Aikaterini Tziveleka, Panayiotis Bilalis, Alexandros Chatzipavlidis, Nikos Boukos, and George Kordas.
- **9<sup>th</sup> International Conference on Nanosciences & Nanotechnologies (NN12)**, 3-6 July 2012, Thessaloniki, Greece (**oral by me**). "*Designed Fabrication Of A Multifunctional Polymer Nano-Platform For Dual Activated Controlled Drug Release*". Panayiotis Bilalis, Alexandros Chatzipavlidis, Leto-Aikaterini Tziveleka, Nikos Boukos, C.A. Charitidis and George Kordas.
- **Macro 2014**, 6-11 July 2014, Chiang Mai, Thailand (**oral by other**). "*Responsive Polymers based on Poly(L-Histidine) for Drug Delivery to Treat Pancreatic Cancer: From Micelles to In Situ Forming Infectable Self-Healing Hydrogels*". H. Iatrou, K. Dimas, P. Bilalis, A. Karatzas, C. Tsimblouli.
- **10th Hellenic Polymer Society Conference**, 4-6 December, Patra (**4 posters**).

- **4th International Conference on Bio-Sensing Technology 2015**, 10-13 May 2015, Lisbon, Portugal (**poster**). “*Evaluation of nanoparticle bioconjugates for paper lateral flow biosensors signal enhancement*”. D.K. Toubanaki, **P. Bilalis**, H. Iatrou, E. Karagouni.
- **NN15 International Conference on Nanosciences & Nanotechnologies**, 7-10 July 2015. Thessaloniki (**poster**). “*Evaluation of graphene oxide-magnetic-gold nanohybrids as enzyme mimics for biosensing applications*”. D.K. Toubanaki, **P. Bilalis**, M. Margaroni, H. Iatrou, E. Karagouni.
- **Warwick Polymer Conference 2016**, 11-14 July 2016. Warwick. (**poster**). “*Modification of Graphene Oxide with polypeptoides through Surface Initiated Ring Opening Polymerization*”. **Panayiotis Bilalis**, Reem D. Alghamdi, George Zapsas, Nikos Hadjichristidis.
- **International Symposium on Ionic Polymerization – IP 2017**, Durham, September 17<sup>th</sup> – 22<sup>nd</sup>. (**2 posters**). 1) “*Anionic Polymerization in the Presence of Phosphazene Bases*”. Konstantinos Ntetsikas, George Polymeropoulos, Yahya Alzahrany, **Panayiotis Bilalis**, Yves Gnanou, Nikos Hadjichristidis. 2) “*Stitching*” and Polyhomologation. A Novel Method towards Well-defined Polymethylene-Based Star Block Copolymers”. George Zapsas, Konstantinos Ntetsikas, Zhen Zhang, Joey Kim, **Panayiotis Bilalis**, Nikos Hadjichristidis.
- **12<sup>th</sup> Hellenic Polymer Society International Conference**, 30 Sept. – 3 Oct. 2018 (**2 posters**)

#### INVITED TALKS

- National Technical University of Athens, School of Chemical Engineering NTUA, 9<sup>th</sup> March 2012, Lecture entitled: “Polymeric materials for advanced technologies”.
- University of Athens, Department of Chemistry, 13<sup>th</sup> July 2015, Lecture entitled: “Drug delivery systems based on Poly(L-Histidine)”.

#### PUBLICATION LIST (PEER-REVIEWED PAPERS)

1. **P. Bilalis**, M. Pitsikalis, N. Hadjichristidis\* “Controlled nitroxide-mediated and RAFT polymerization of N-vinylpyrrolidone. Synthesis of block copolymers with styrene and 2-vinylpyridine” *J. Polym. Sci. Polym. Chem.* 2006, 44, 659.
2. **P. Bilalis**, G. Zorba, M. Pitsikalis, N. Hadjichristidis\* “*Synthesis of Poly(n-hexyl isocyanate-b-N-vinylpyrrolidone) Block Copolymers by the Combination of Anionic and*

*Nitroxide-Mediated Radical Polymerizations: Micellization Properties in Aqueous Solutions*" **J. Polym. Sci. Polym. Chem.** 2006, 44, 5719.

3. V. P. Chuang, C. A. Ross\*, P. Bilalis, N. Hadjichristidis "Nanoscale Rings Fabricated Using Self-Assembled Triblock Terpolymers Templates" **ACS Nano** 2008, 2, 2007.
4. A. Karatzas, P. Bilalis, H. Iatrou, M. Pitsikalis, N. Hadjichristidis\* "Synthesis of Well Defined Functional Macromolecular Chimeras Based on Poly(ethylene oxide) or Poly(N-vinyl pyrrolidone)" **React. Funct. Polym.** 2009, 69, 435.
5. A. Chatzipavlidis, P. Bilalis, E. K. Efthimiadou, N. Boukos, G. C. Kordas\* "Sacrificial Template-Directed Fabrication of Superamagnetic Polymer Microcontainers For pH-Activated Controlled Release of Daunorubicin" **Langmuir** 2011, 27, 8478.
6. Efthimiadou E. K., Tapeinos C., Bilalis P., Kordas G\*. "New approach in synthesis, characterization and release study of pH-sensitive polymeric micelles, based on PLA-Lys-b-PEGm, conjugated with doxorubicin." **J. of Nanopart. Res.** 2011, 13, 6725.
7. Bilalis, P., Boukos, N., Kordas G.C\*. "Novel PEGylated pH-sensitive polymeric hollow microspheres." **Mater. Lett.** 2011, 67, 180.
8. Pappas, G.S., Bilalis, P., Kordas, G.C\*. "Synthesis and characterization of SiO<sub>2</sub>-CaO-P2O<sub>5</sub> hollow nanospheres for biomedical applications." **Mater. Lett.** 2011, 67, 273.
9. P. Bilalis, A. Chatzipavlidis, E. K. Efthimiadou, N. Boukos, and G. C. Kordas\*. "Multi-responsive polymeric microcontainers for potential biomedical applications-synthesis and functionality evaluation." **Polym. Int.** 2012, 61, 888.
10. A. Karatzas, P. Bilalis, I.A. Kartsonakis, G.C. Kordas\* "Reversible Spherical Organic Water Microtraps" **J. Non Cryst. Solids** 2012, 358, 443.
11. Efthimiadou E. K., Tziveleka L.A., Bilalis P., Kordas G\*. "Novel PLA modification of organic microcontainers based on ring opening polymerization: Synthesis, characterization, biocompatibility and drug loading/release properties." **Int. J. Pharm.** 2012, 428, 134.
12. P. Bilalis, A. Chatzipavlidis, L.A. Tziveleka, N. Boukos, and G. Kordas\*. "Nanodesigned magnetic polymer containers for dual stimuli actuated drug controlled release and magnetic hyperthermia mediation." **J. Mater. Chem.** 2012, 22, 13451.
13. Chatzipavlidis A., Bilalis P.\*, Tziveleka L.A., Boukos N., Charitidis C.A., Kordas G\*. "Nanostructuring the surface of dual responsive hollow polymer microspheres for versatile utilization in nanomedicine-related applications." **Langmuir** 2013, 29, 9562.

14. Tziveleka L.A., Bilalis P., Chatzipavlidis A., Boukos N., Kordas G. "Development of multiple stimuli responsive magnetic polymer nanocontainers as efficient drug delivery systems" **Macromol. Biosci.** 2014, 14, 131.
15. Bilalis P., Katsigiannopoulos D., Avgeropoulos A.\*, Sakellariou G\*. "Non-covalent functionalization of carbon nanotubes with polymers" **RSC Adv.** 2014, 4, 2911.
16. Mavrogiorgis, D., Bilalis, P., Karatzas, A., Skoulas, D., Fotinogiannopoulou, G., Iatrou, H.\* "Controlled polymerization of histidine and synthesis of well-defined stimuli responsive polymers. Elucidation of the structure-aggregation relationship of this highly multifunctional material" **Polym. Chem.** 2014, 5, 6256.
17. Hamley, I.W.\* , Kirkham, S., Dehsorkhi, A., Castelletto, V., Adamcik, J., Mezzenga, R., Ruokolainen, J., Mazzuca, C., Gatto, E., Venanzi, M., Placidi, E., Bilalis, P., Iatrou, H. "Self-assembly of a model peptide incorporating a hexa-histidine sequence attached to an Oligo-Alanine sequence, and binding to gold NTA/nickel nanoparticles" **Biomacromolecules** 2014, 15, 3412.
18. George V. Theodosopoulos, Panayiotis Bilalis\*, Georgios Sakellariou\*." *Polymer Functionalized Graphene Oxide: A Versatile Nanoplatfom for Drug/Gene Delivery*" **Curr. Org. Chem.** 2015, 19, 1828.
19. Bilalis P.\*, Varlas S., Kiafa A., Velentzas A., Stravopodis D., Iatrou H.\* "Preparation of Hybrid Triple-Stimuli Responsive Nanogels Based on Poly(L-Histidine)". **J. Polym. Sci. Polym. Chem.** 2016, 54, 1278.
20. Bilalis P.\*, Tziveleka A.L., Varlas S., Iatrou H.\* "pH Sensitive Nanogates Based on Poly(L-histidine) for Controlled Drug Release From Mesoporous Silica nanoparticles". **Polym. Chem.** 2016, 7, 1475.
21. Kirkham S., Castelletto V., Hamley I.W.\* , Reza M., Ruokolainen J., Hermida-Merino D., Bilalis P., Iatrou H. "Self-Assembly of Telechelic Tyrosine End-Capped PEO and Poly(alanine) Polymers in Aqueous Solution". **Biomacromolecules** 2016, 17, 1186.
22. Alkayal N., Zapsas G., Bilalis P., Hadjichristidis N.\* "Self-assembly behavior of well-defined polymethylene-block-poly(ethylene glycol) copolymers in aqueous solution". **Polymer** 2016, 107, 415.
23. Polymeropoulos G., Bilalis P., Hadjichristidis N.\* "Well-Defined Cyclic Triblock Terpolymers: A Missing Piece of the Morphology Puzzle". **ACS Macro Lett.** 2016, 5, 1242.
24. Ladelta V., Bilalis P., Gnanou Y., Hadjichristidis N.\* "Ring-opening polymerization of  $\omega$ -pentadecalactone catalyzed by phosphazene superbases". **Polym. Chem.** 2017, 8, 511.

25. Alkayal N., Zhang Z., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Polyethylene-Based Tadpole Copolymers”. **Macromol. Chem. Phys.** 2017, 218, 1600568.
26. Polymeropoulos G., Zapsas G., Ntetsikas K., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Polymers with Complex Architectures”. **Macromolecules** 2017, 50, 1253.
27. Z. Zhang, P. Bilalis, H. Zhang, Y. Gnanou, N. Hadjichristidis\* “Core Cross-Linked Multiarm Star Polymers with Aggregation-Induced Emission and Temperature Responsive Fluorescence Characteristics”. **Macromolecules** 2017, 50, 4217.
28. Ntetsikas K., Alzahrany Y., Polymeropoulos G., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Anionic polymerization of styrene and 1,3-butadiene in the presence of phosphazene superbases”. **Polymers** 2017, 9, 538.
29. Zapsas G., Ntetsikas K., Kim J., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Boron “stitching” reaction: A powerful tool for the synthesis of polyethylene-based star architectures”. **Polym. Chem.** 2018, 9, 1061.
30. Ladelata V., Kim J., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Block Copolymers of Macrolactones/Small Lactones by a “catalyst-Switch” Organocatalytic Strategy. Thermal Properties and Phase Behavior”. **Macromolecules** 2018, 51, 2428.
31. Patil Y., Bilalis P., Polymeropoulos G., Almahdali S., Hadjichristidis N., Rodionov V.\* “A Novel Poly(vinylidene fluoride)-Based 4-Miktoarm Star Terpolymer: Synthesis and Self-Assembly”. **Mol. Pharmaceutics** 2018, 15, 3005.
32. Bilalis P., Skoulas D., Karatzas A., Marakis J., Stamogiannos A., Tsimblouli C., Sereti E., Stratikos E., Dimas K., Vlassopoulos D., Iatrou, H.\* “Self-Healing pH- and Enzyme Stimuli-Responsive Hydrogels for Targeted Delivery of Gemcitabine to Treat Pancreatic Cancer”. **Biomacromolecules** 2018, 19, 3840.
33. Sutisna B., Bilalis P., Musteata V., Smilgies D.-M., Peinemann K.-V., Hadjichristidis N.\* , Nunes S.P.\* “Self-Assembled Membranes with Featherlike and Lamellar Morphologies Containing  $\alpha$ -Helical Polypeptides”. **Macromolecules**, 2018. Article in press.
34. Nikovia C., Theodoridis L., Alexandris S., Bilalis P., Hadjichristidis N., Floudas G.,\* Pitsikalis M.\* “Macromolecular Brushes by Combination of Ring Opening, and Ring Opening Metathesis Polymerization. Synthesis, Self-Assembly, Thermodynamics and Dynamics”. **Macromolecules**, 2018. Article in press.
35. Ntetsikas K., Polymeropoulos G., Zapsas G., Bilalis P., Gnanou Y., Hadjichristidis N.\* “Ultrafast Phosphazene-Promoted Controlled Anionic Polymerization of Styrenic Monomers”. **J. Polym. Sci. Polym. Chem.** 2018. DOI: 10.1002/pola.29258



36. Varlas S., Georgiou P.G., Bilalis P., Jones J.R., Hadjichristidis N.,\* O'Reilly R.K.\*.  
"Poly(Sarcosine)-Based Nano-Objects with Multi-Protease Resistance by Aqueous  
Photoinitiated Polymerization-Induced Self-Assembly (Photo-PISA)".  
*Biomacromolecules* 2018. DOI: 10.1021/acs.biomac.8b01326

### Summary

**Total number of journal papers: 36**

**Total citations:** 656, *h index* = 15 (Source: Google Scholar)

**Total citations:** 535, *h index* = 14 (Source: Web of Science)

**Total citations:** 562, *h index* = 14 (Source: Scopus)

**Average Impact Factor of the published Journals:** 4.38 (2017 Impact Factors)

## TEACHING EXPERIENCE

- **Teaching Assistant** for the Course: "Polymers and Polymerization Processes".  
Academic years: 2016-2017, 2017-2018, 2018-2019.  
Physical Science and Engineering Division, KAUST, Saudi Arabia.  
<https://academicaffairs.kaust.edu.sa/Courses/Pages/DownloadSyllabus.aspx?Year=2018&Semester=020&Course=0018334&V=I>

## ADVISING

- **M.Sc. Theses**
  - Anagnostakis G. (2008, University of Athens, Greece)
  - Kainourgios P. (2012, NCSR Demokritos, Greece)
  - Pappas G. (2012, NCSR Demokritos, Greece)
  - Skoulas D. (2015, University of Athens, Greece)
  - Varlas S. (2015, University of Athens, Greece)
  - Liarou E. (2015, University of Athens, Greece)
  - Apostolidi P. (2015, University of Athens, Greece)
  - Merilees M. (2017, Internship, KAUST, Saudi Arabia)
- **Ph.D. Theses**
  - Chatzipavlidis A. (2012, NCSR Demokritos, Greece)
  - Alkattan N. (2016, KAUST, Saudi Arabia)
  - Alghamdi R. (2018-, KAUST, Saudi Arabia)
  - Algarni F. (2018-, KAUST, Saudi Arabia)
  - Aldakheel F. (2018-, KAUST, Saudi Arabia)

## PROFESSIONAL ACTIVITIES

- **Reviewer at high Impact Factor Journals:**

European Polymer Journal

Polymer Chemistry

Journal of Materials Chemistry B

Materials Letters

Current in Organic Chemistry

Journal of Chemistry (open access)

Analytical Letters

Colloids and Surfaces A: Physicochemical and Engineering Aspects

International Journal of Pharmaceutics

Materials Science & Engineering C

- **Member of the Greek Chemical Society.**

## PATENTS

### INTERNATIONAL PATENTS

1. **FUNCTIONAL MULTI-STIMULI RESPONSIVE POLYMERIC NANOCONTAINERS-MICROCONTAINERS AS DRUG DELIVERY SYSTEMS**

**Inventor(s), applicant(s):** KORDAS GEORGIOS [GR]; KARTSONAKIS IOANNIS [GR]; BILALIS PANAGIOTIS [GR]; TSIVELEKA AIKATERINI-LITO [GR]; EFTHYMIADOU ELENI [GR]; TAPEINOS CHRISTOS [GR]; CHATZIPAVLIDIS ALEXANDROS.

**Classification: - international:**

**A61K41/00; A61K47/48; A61K9/51; B01J13/14; B82Y5/00; C08F20/02; H01F1/00**

2. **METHOD FOR THE ULTRAFAST CONTROLLED ANIONIC POLYMERIZATION OF STYRENIC MONOMERS**

**Inventor(s), applicant(s):** Konstantinos Ntetsikas, George Polymeropoulos, George Zapsas, Panayiotis Bilalis, Yves Gnanou, Nikos Hadjichristidis.

### GREEK PATENT

- 1. Pentablock Polypeptidic and Hybrid Polymers to give In Situ Forming Injectable Self-Healing pH and Temperature Responsive Hydrogels for Localized Targeted Delivery of Gemcitabine.**

**Inventor(s), applicant(s):** Bilalis, P., Tsimblouli, C., Dimas, K., Vlassopoulos, D., Iatrou, H.

## REFERENCES

Reference letters are available upon request.