Europass Curriculum Vitae

Personal information

Name	**CARMEN TRIPON**
Telephone	+40-264-584037 / int.179 Fax: +40-264-420042
E-mail	carmen.tripon@itim-cj.ro
Nationality	Romanian
Date of birth	July 13, 1976
Gender	female
Occupational field	**Scientific researcher 3rd degree**

Work experience

Ian 2004 - present	Scientific researcher at the National Institute for R&D of Isotopic and Molecular Technologies, Cluj-Napoca. **Experience in**: *(a)* photothermal techniques and applications; *(b)* solid-state Nuclear Magnetic Resonance spectroscopy (ss-NMR) for structural and dynamical study of biological compounds; *(c)* crystalline structure determination of pharmaceutical compounds using powder X-ray diffraction (PXRD) and infrared spectroscopy (FTIR); *(d)* invesigation of structural changes in DNA molecules using vibrational spectroscopy techniques;
Main activities and responsibilities	Characterization of thermal properties of various classes of liquid and solid materials, using photothermal techniques; Research in structural characterization of biological compounds using various spectroscopic techniques.
Name and address of employer	National Institute for R&D of Isotopic and Molecular Technology Cluj-Napoca, 67-103 Donat Str., 400293 Cluj-Napoca

Education and training

2002-2009	**PhD student** at Faculty of Physics, "Babes-Bolyai"University, Cuj-Napoca, with the thesis entitled “New Techniques in Solid-State Nuclear Magnetic Resonance: Methodological Developments and Applications”.

2001–2002	**Master of science** in physics of oxide materials at Faculty of Physics, "Babes-Bolyai"University, Cuj-Napoca
1996-2001	**Student** at Faculty of Physics, "Babes-Bolyai"University, Cuj-Napoca, Bachelor of Science in 2001
International specializations	**University of Warwick, UK (2008-2011)**: during this period, I have been completed 4 stages as visiting scientist at the Solid-State NMR group as part of a ***Royal Society International Joint Project*** entitled "***^{1}H Solid-State NMR: using algebraic insight and simulation to enhance experiment***" (code 2007/R4)

Personal skills and competences

Mother tongue(s)	Romanian
Foreign Languages	English
Organisational skills and competences	***Experience accumulated in national/international projects***. **- Principal Investigator (PI)** of the National Post-Doctoral grant PN-II PD_53: ***Modern approaches for solid form screening of active pharmaceutical ingredients and structural characterization on powders***, financed by the Romanian National Authority for Scientific Research (CNCS-UEFISCDI), project number PN-II-RU-PD-2011-3-0021. Total Amount 69767 Euros. Ongoing period: 2011-2013. Web page : http://www.itim-cj.ro/PNCDI/ru53/ - Member in the research team of 7 national projects and of 1 Royal Society International Joint Project
Technical skills and competences	***Elaborated and/or Published Papers*:** - 32 papers (27 in international journals) - citations nr. (excluding self-citations): 173 During 2004-2016, I have participated to several scientific meetings, which have taken place in the United Kingdom (2006), Greece (2006), United States (2007), Spain (2007), Russia (2008), Hungary (2011), Italy (2012), Ireland (2012), Bulgaria (2012) and Potugal (2013)

Important scientific achievements of the project leader

During the last 12 years my work as scientific researcher has been focused on elucidating the molecular architecture of several classes of compounds, such as active pharmaceutical ingredients and oxide glasses with transitional metal ions, as well on investigating the structural changes at the DNA level generated by the influence of different physico-chemical factors (metal counterions, UV and microwaves irradiation).

Expertise areas:

(*) investigation of the UV induced degradation process which occurs in DNA molecules isolated from various plant species;

(**) solid-form screening of new active pharmaceutical ingredients and elucidation of their crystalline packing;

(***) establishing the molecular structure for different types of compounds applying solid-state NMR spectroscopy;

Main research achievements:

(i) *Phothermal characterization of different classes of liquid and solid materials*, using photopyroelectric (**PPE**) technique; characterization of thermoelectric compounds using photothermoelectric (**PTE**) technique.

(ii) *Fourier transform infrared spectroscopic (FTIR) analysis of genomic DNA from in vitro grown plant species, before and after UV exposure,* revealed that radiation leads to severe damage of DNA, associated with the structure of nucleic acid bases, base pairing and base unstacking. UV radiation was also shown to affect the DNA conformation and sugar groups structure. Although the A-form DNA is the predominant conformation in both non-irradiated and irradiated samples, Z-type DNA conformation presence was also detected.

(iii) Surface-enhanced Raman spectroscopy (SERS) of genomic DNA from in vitro grown tomato cultivars performed for control and cryopreserved samples, showed that mostly dA, dG and dT residues seems to be influenced upon cryogenic storage of tomato shoot apices. These changes reflect unstacking of DNA bases. Not any other significant structural changes of genomic DNAs from tomato cultivars have been noticed upon cryopreservation process. Since the absence of relevant DNA structural effects upon cryogenic storage of shoot apices has been observed, there is a conclusion in favor of this treatment to be applied for some cultivars.

(iv) *Quantification of the binding effects of Mg^{2+}, Ca^{2+} and Cu^{2+} ions on the vibrational properties of guanine-cytosine (GC) Watson-Crick and Hoogsteen base pairs* using the density

functional theory (DFT) approach. In particular, the specific nitrogen position in guanine at which the metal ion is coordinated has been established for each of the Watson-Crick and Hoogsteen configurations. Moreover, the vibrational bands that can be used to detect the presence of metallic ions in the Watson-Crick and Hoogsteen GC structures were indicated.

(iv) *A new polymorph of the antiviral drug Acyclovir has been found and its molecular architecture was established*. The crystal structure of this new solid form was obtained using a protocol which combines X-ray powder diffraction with complementary techniques such as solid-state NMR, FTIR, DSC and molecular modeling. The crystalline packing was shown to be based on non-covalent interaction which involves the primary and secondary amines, and also the hydroxyl group located at the aliphatic edge of the Acyclovir molecule.

From 2011 since 2013 the project leader has coordinated as **Principal Investigator** a postdoctoral grant entitled "*Modern approaches for solid form screening of active pharmaceutical ingredients and structural characterization on powder"*. During this period of time, the research activity of the project leader have been focused on obtaining new solid forms (polymorphs, solvates/hydrates, salts) of Acyclovir, Ciprofloxacin, Lisinopril and Efavirenz pharmaceutical compounds using parallel crystallization methods, followed by their structural characterization through adequate combination of modern analytical techniques – i.e. powder X-ray diffraction, solid-state NMR, FTIR spectroscopy and molecular modeling. The systematic study of the solid state is essential for pharmaceutical compounds since the understanding of their crystallization general behavior provides important contributions in defining the structure-biological activity relationships, and also, allows the selection of those new solid forms with improved therapeutic properties. The most important scientific achievement obtained within this grant was the elucidation of molecular architecture of Lisinopril dihydrate, a commonly prescribed drug for the treatment of high blood pressure. This is reflected in the publication of the results as co-author in CrystEngComm journal, with an Impact Factor of 3.8.

The previously described personal scientific outcomes have been acquired using the following methods as experimental and theoretical background: (1) molecular / biomolecular vibrational spectroscopy (FT-IR, Raman/SERS spectroscopy); (2) solid-state NMR spectroscopy; (3) X-ray powder diffraction; (4) computational methods for spectral simulation.

The autonomy and visibility of the scientific activity.

The degree of autonomy of the research activity developed by the project leader is confirmed by the following **factual arguments:**

(FA 1) Principal Investigator (PI) of the Post Doctoral grant PN-II PD_53: ***Modern approaches for solid form screening of active pharmaceutical ingredients and structural characterization on powders***, financed by the Romanian National Authority for Scientific Research (CNCS-UEFISCDI), project number PN-II-RU-PD-2011-3-0021. Total Amount 69767 Euros. Ongoing period : 2011-2013. Web page : http://www.itim-cj.ro/PNCDI/ru53/

(FA 2) Hirsch Index: 8 (according to ISI Web of Science)

(FA 3) Total number of citations (without self-citations): 173 (according to Web of Science)

During 2004-2016, I have been participated to *scientific meetings*, which have taken place in the United Kingdom (2006), Greece (2006), United States (2007), Spain (2007), Russia (2008), Hungary (2011), Italy (2012), Ireland (2012), Bulgaria (2012) and Potugal (2013).

In 2013 I have won a bursary in amount of 400 Euro awarded by the European Biophysical Societies' Association (EBSA) to participate to the annual European Congress of Biophysics which has been held in Lisbon, Portugal.

During 2008-2011 I have been carried out **4 stages to Warwick University, United Kingdom,** in the solid-state NMR laboratory, under the supervision of Prof. Steven P. Brown.