

Research Profile

Name: **Anant Paradkar**
 Position: **Professor and Director,**
 Institute/division: **Centre for Pharmaceutical Engineering Science**
 Email: **A.Paradkar1@Bradford.ac.uk**
 Tel: **+44-1274-233900**



SUMMARY OF MY RELEVANT RESEARCH AREAS:

My research interest is pharmaceutical formulation and process development. I work with an interdisciplinary team comprising engineers, physicists, pharmacists. My main interest is development of innovative processes and products for pharmaceutical applications especially involving polymers. Another major focus is understanding processes and products through use of process analytical technology.

我的研究兴趣是药剂的配方和工艺开发。我和一个跨学科的团队一起工作，其中包括工程师，物理学家和药剂师。我的主要兴趣是开发创新过程和制药应用产品，尤其是涉及聚合物的产品。另一个主要重点是通过使用过程分析技术而了解工艺和产品。

Primary Research interests:

Process Development: Currently my research focus is on non-infringing processing technologies for pharmaceuticals with special emphasis on Hot Melt Extrusion (HME) and Ultrasound Assisted processing. Our interdisciplinary team has developed the application of HME for co-crystallization. This solvent-free continuous technology offers many advantages and easy for scale-up and commercialization. In process development we also focus on process optimization and characterization of process related properties like extensional rheology. We have received £ 500k funding from EPSRC for this research.



Formulation Development: In the area of formulation development my focus is poorly soluble drug and nutraceutical molecules. We develop amorphous and liquid crystalline systems different purposes.

The novel drug delivery concepts are also extended to molecules from natural products. We are developing nanoparticulate delivery systems for treatment of neurodegenerative conditions, cancers and endometriosis.

Process Analytical Technology: The interdisciplinary group provides us with strong engineering expertise required for process analytics. Application of in-line measurement systems are being used to understand the mechanisms of novel products developed and process optimization.

Topics in which you would like to develop collaborative research:

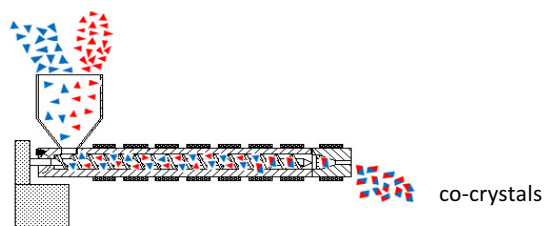
- a. **Polymeric drug delivery systems: Targeted, Structured, controlled delivery, stimuli sensitive systems, microneedles, transdermal and bioadhesive patches, solid dispersions, drug eluting stents.**
- b. **Innovative technologies for pharmaceutical processing: Spray drying, Ultrasound, magnetic arrays or microwave based technologies.**
- c. **Process Analytical Technologies for pharmaceutical applications: use of vibrational spectroscopy, ultrasound attenuation and velocity measurement, rheology.**

Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

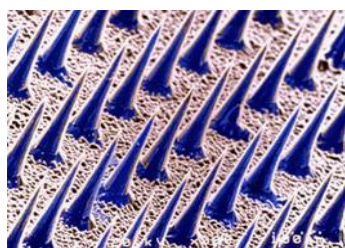
1. Ultrasound assisted processing of pharmaceuticals: Professor Guo, Chengdu University
2. Nanoparticulate curcumin for Alzheimer based on using enhancers based on Traditional Chinese System of Medicine (TCM). : Dr Yilin, Changzhou Public Hospital and Professor Hu, Yilin University.
3. Ultrasound assisted processing: Professor Jarkko Ketolainen, Kuopio University, Finland
4. Rheology of liquid crystalline systems: Dr Guruswamy and Dr Suresh Bhat, National Chemical Laboratory , Pune, India.
5. Analytical techniques: Professor K R Mahadik, Bharati Vidyapeeth University, Pune
6. Green processing technologies: Professor G D Yadav, University Institute of Technology, Mumbai, India.

Relevant graphics, figures, pictures:

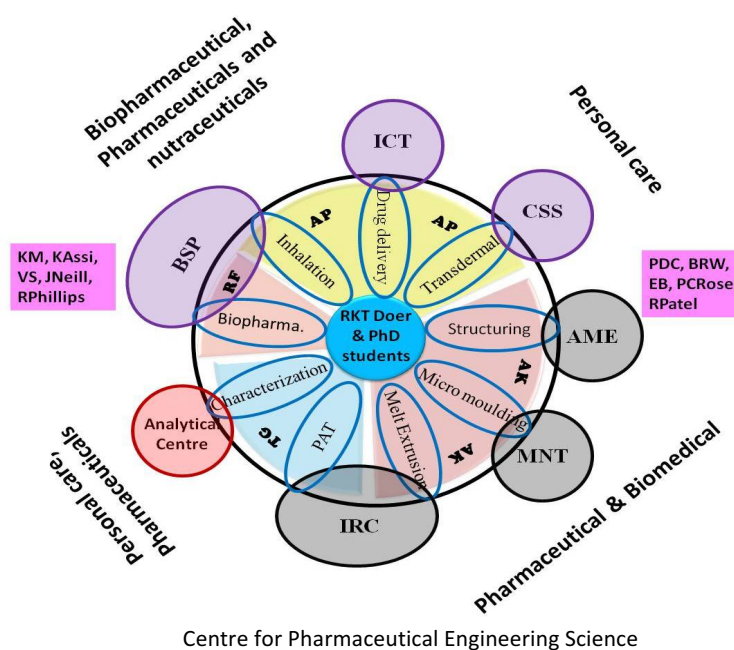
Drug Co-former



Hot melt extrusion co-crystallisation Technology



Microneedles



Centre for Pharmaceutical Engineering Science

Publications and other outputs relevant to your interest in this programme

Patent:

Anant Paradkar, Adrian Kelly, Phil Coates, Peter York. Method and Product; PCT/GB2009/050924; 27/07/2009 (WO/2010/013035; 04/02/2010)

Papers:

- Sameer Ketkar, Sudhir K. Pagire, N. Rajesh Goud, Kakasaheb Mahadik, Ashwini Nangia, and Anant Paradkar Tracing the Architecture of Caffeic Acid Phenethyl Ester Cocrystals: Studies on Crystal Structure, Solubility, and Bioavailability Implications *Cryst. Growth Des.*, Article ASAP (accepted 19th August 2016) DOI: 10.1021/acs.cgd.6b00759
- Kulkarni, C., Wood, C., Kelly, A.L., Gough, T., Blagden, N., Paradkar, A. Stoichiometric Control of Co-Crystal Formation by Solvent Free Continuous Co-Crystallization (SFCC) (2015) *Crystal Growth and Design*, 15 (12), pp. 5648-5651.
- Wenting Bao, Hong Wu, Shaoyun Guo, Anant Paradkar, Adrian Kelly, Elaine Brown, Phil Coates Effect of Ultrasound on Molecular Structure Development of Polylactide *Polymer-Plastics Technology and Engineering* 06/2014; 53(9):927-934. DOI: 10.1080/03602559.2014.886062, 2014
- Ravindra Dhumal, Adrian Kelly, Phil Coates, Peter York, Anant Paradkar . 2010. Cocrystallization and simultaneous agglomeration using hot melt extrusion. *Pharm. Res.* 27, 2725-2733
- Rohit Mulik, Jukka Monkkonen, Risto Juvonen, Kakasaheb Mahadik, and Anant Paradkar. 2010. ApoE3 Mediated Poly(butyl) Cyanoacrylate Nanoparticles Containing Curcumin: Study of Enhanced Activity of Curcumin against Beta Amyloid Induced Cytotoxicity Using In Vitro Cell Culture Model. *Molecular Pharmaceutics*, 7 (3), 815- 825
- Suyog Aher, Ravindra S. Dhumal, Kakasaheb Mahadik, Anant R. Paradkar , Peter York. 2010. Ultrasound assisted cocrystallization from solution (USSC) containing a non-congruently soluble cocrystal component pair: Caffeine/maleic acid. *Eur. J. Pharm. Sci.* 41, 597-602
- Dhumal, RS, Kelly, AL, York, P, Coates, PD, Paradkar, A Cocrystallization and Simultaneous Agglomeration using Hot Melt Extrusion, *Pharmaceutical Research* 27 2725-2733 DOI:10.1007/s11095-010-0273-9 (2010)