

## A. Cuneys Tas, Ph.D.

1993: PhD in Ceramic Engineering (Iowa State, USA)  
06/'93-11/'97: Assistant Professor (METU, Turkey)  
11/'97-01/'02: Associate Professor (METU)  
02/'99-02/'01: Visiting Professor (Max-Planck-Institut)  
09/'01-04/'03: Senior Staff Scientist (Merck, Germany)  
05/'03-04/'06: Research Prof. (Clemson Univ., USA)  
05/'06-11/'06: Professor (Mersin University, Turkey)  
11/'06-9/'10: Professor (Yeditepe University, Turkey)  
08/'07-06/'08: Visiting Prof. (New York Univ, USA)  
9/'10-9/'11: Visiting Prof. (Univ. of Oklahoma, USA)  
4/'12-6/'15: Res. Scholar (Univ. of Illinois, USA)  
7/'15-to date: Principal Scientist (Solidia Techno., USA)

### Publications

Peer-reviewed publications:	71
Google Scholar citations:	4943
h-index: 34	i10-index: 64
Symposium presentations:	126
Book chapters:	34
ICDD X-ray diffraction patterns:	18
Phase diagrams:	2

### Patents

US Patents: 4	PCT Patents: 2
European Patents: 4	Canadian Patents: 2
German Patents: 2	French Patent: 1
British Patents: 2	Turkish Patents: 9

### Product-on-the-market

“*Calcibon<sup>®</sup> Granules*”: Micro- and macro-porous apatitic, bone-like calcium phosphate spherical granules (1 to 6 mm in diameter) used for the clinical repair of bone defects since 2003. These have been the first porous granules ever produced “at room temperature by using a self-setting, orthopedic cement material.” Granules were made by Dr. Tas at Merck Biomaterials GmbH in Darmstadt, and are currently marketed by Biomet Europe. See: [http://www.cuneyttas.com/Calcibon-GPS\\_2\\_protocol.pdf](http://www.cuneyttas.com/Calcibon-GPS_2_protocol.pdf), US Patent 7,381,262 and *J. Mater. Sci. Mater. Med.*, 19(5), 2231-2239 (2008).

### Awards / Honors

- Elected, Member/ International Centre for Diffraction Data (since May 1997)
- Faculty Excellence in Teaching Awards (METU), 1993, 1999, and 2000 (3000 USD each + certificate)
- Max-Planck-Society Scholarship (Feb1999-Feb2001)

### Student Advising

- 12 graduate theses supervised & completed (5 in METU-Turkey, 5 in Clemson Univ.-USA, 2 in Max-Planck-Institut / Germany),
- >50 undergrads were assigned research projects

### Contributions to Inorganic Materials Science

1.) Urea decomposition, catalyzed by its enzyme urease, is a regulated (*in terms of supply*) source of HCO<sub>3</sub><sup>-</sup> ions in synthesis solutions. This method was demonstrated to produce Y(Cr, Co)O<sub>3</sub>, LaAlO<sub>3</sub>,

November 13, 2018

Pb(Zr<sub>0.52</sub>Ti<sub>0.48</sub>)O<sub>3</sub>, Gd-doped CaZrO<sub>3</sub>, Sr- and Zn-doped LaGaO<sub>3</sub>, GaO(OH), Mn-doped ZnGa<sub>2</sub>O<sub>4</sub> (Patent No: EP 1 227 139), CaCO<sub>3</sub>, and “biomimetic” calcium phosphates.

2.) Synthetic body fluids (SBF), mimicking the blood plasma in terms of ion concentrations, can *in situ* form nanosize calcium phosphate (CaP) particles. Author has developed a Tris-buffered SBF solution back in 1997 (published in 1999, *J. Eur. Ceram. Soc.*) with a HCO<sub>3</sub><sup>-</sup> concentration (i.e., 27 mM) exactly equal to that of human plasma. Developed “10xSBF” solution (*J. Mater. Res.*, 2004) for “coating” bioinert ceramics, polymers, or metals with a CaP layer to make their surfaces more osteoinductive.

3.) Synthesized carbonated nanopowders (*in bulk quantities*) of calcium phosphates by using an SBF solution (*Biomaterials*, 2000) and/or enzyme-catalyzed biomimetic synthesis at 37°C (*J. Mater. Sci. Lett.*, 2001)

4.) Used DMEM cell culture solutions, instead of SBF, to test the *in vitro* biocompatibility of CaP biomaterials & Ti (*Mater. Sci. Eng. C*, 2010 and 2014)

5.) Tris- or Hepes-free SBF solutions by using Na-lactate and lactic acid pair (Lac-SBF) (*Pasinli et al., Acta Biomater.*, 2010 and 2012)

6.) Biphasic CaP synthesis (*J. Am. Ceram. Soc.*, 1998)

7.) Hydroxyapatite powders of high thermal stability (*Biomaterials*, 2000), which did not decompose to β-TCP even at 1500°C

8.) Three different methods of synthesizing whiskers (*i.e.*, single crystals) of calcium phosphate (*either β-TCP or HA*) biomaterials at <100°C or 1200°C (*J. Am. Ceram. Soc.*, 2001 & 2007 and *J. Mater. Res.*, 2004)

9.) Various self-setting cements for bone defect repair: [1] *J. Mater. Sci. Mater. M.*, 16, 167-74 (2005), [2] Patent No's: US 6,929,692 & US 7,381,262 [3] *Int. J. Appl. Ceram. Tech.*, 4, 152-163 (2007)

10.) First monetite (CaHPO<sub>4</sub>) cement (2005)

11.) “Biconvex micropills” of CaCO<sub>3</sub>. Such micropills, in any material system, were not possible before this work (US Patent No: 8,470,280)

12.) Rhenanite (NaCaPO<sub>4</sub>)-apatite biphasics

13.) “Dumbbell-shaped” brushite (CaHPO<sub>4</sub>·2H<sub>2</sub>O) crystals (2010) and brushite micro-granules (2012)

14.) “Calcium metal” to synthesize amorphous calcium phosphate (2012) US patent 9,108,860 (2015)

15.) Amorphous calcium phosphate (ACP) nanospheres formed in DMEM-like (2013) or synthetic body fluid (Lac-SBF) solutions (2014)

16.) Nano-CaP of 900 m<sup>2</sup>/g BET surface area (2014)

17.) Aragonite is reactive in Lac-SBF solutions (2014)

18.) Novel “aragonite coating solutions” (ACS) (2015)

19.) Whitlockite synthesis from brushite (2016)