
Biosketch – FRED KIMOCK, Ph.D.

NAME Fred M. Kimock, Ph.D.	POSITION TITLE Managing Partner, Technology & Operations Lead Technologist, NEATCap Medical, LLC		
eRA COMMONS USER NAME KIMOCKF1			
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Muhlenberg College, Allentown, PA	B.S.	05/81	Chemistry
The Pennsylvania State University, State College, PA	Ph.D.	05/85	Chemistry (Analytical)

A. Personal Statement

Dr. Fred Kimock has a 30-year history of innovative development and commercialization of high-value products with superior performance incorporating advanced materials and coatings in medical, electronics, aerospace, and consumer markets. Using a customer-centric, practical innovation approach, Dr. Kimock has worked closely with market innovators and early adopters, and delivered many successful new products from concept to volume manufacturing.

He holds 27 U.S. patents and 1 patent pending, and has published over 25 technical articles in peer-reviewed journals and trade publications.

In his career, Dr. Kimock has held many technical and executive management positions of responsibility, including CTO and president of small technology-driven businesses, and Vice President, Technology of a large multi-national materials engineering company. He was co-Chair of the Industrial Advisory Board for the NSF-sponsored Biomimetic Microelectronic Systems Engineering Research Center at the University of Southern California. He has taught his Invention-to-Market Innovation approach for entrepreneurship, development, and commercialization of new technologies at the university level.

As Managing Partner, Technology & Operations and Lead Technologist, Dr. Kimock brings his experience in engineering product development, project management, and collaborative partner interface to NEATCap Medical.

Dr. Kimock has led the product and manufacturing process design and development for DREAMIES. The product work has included acoustic measurements with a novel test apparatus (DONNE – Detector of Neonatal Noise Exposure); material selection; product design, and test. Manufacturing process design and development involved fabrication by 3d printing, molding, and a variety of cutting, coating, and bonding technologies. Dr. Kimock's team members have included collaborators with expertise in data analysis, mechanical engineering, acoustics, manufacturing, and regulatory requirements, as well as NICU clinical staff.

B. Positions and Honors

1981: Maga Cum Laude, Phi Beta Kappa, Muhlenberg College
1985: Xerox Research Award winner, Pennsylvania State University
1985-1990: Air Products and Chemicals, *Senior Research Chemist, Principal Research Chemist*
1990-1997: Diamonex, Incorporated, and Diamonex Unit of Monsanto Company, *Manager, Director of R&D, then Vice President of Technology & Operations, CTO.*
1998-2001: Diamonex, Incorporated, *President*
2002-2010: Morgan Advanced Ceramics, Inc, *Vice President, Technology*
2011-present: Four Circle, Incorporated, *President, Consultant, Program Manager*
2013: Lehigh Univ. Baker Institute, *Entrepreneur in Residence, Visiting Scholar*
2011-present: NEATCap, LLC, *Lead Technologist*
2015-present: NEATCap Medical, LLC, *Managing Partner, Technology & Operations, Lead Technologist*

Prior Affiliations:

- Biomimetic Microelectronic Systems ERC, Industrial Advisory Board Co-Chair
- Ceramic, Composite and Optical Materials Consortium
- American Ceramics Society
- American Vacuum Society
- Materials Research Society

C. Selected Peer-reviewed Publications

1. Winograd, N., Baxter, J. P., and Kimock, F. M. (1982). Multiphoton Resonance Ionization of Sputtered Neutrals: A Novel Approach to Materials Characterization, *Chem. Phys. Lett.* 88 (6) 581-584.
2. Kimock, F. M., Baxter, J. P., Kobrin, P. H., Pappas, D. L. & Winograd, N. (1983). Trace analysis of solid surfaces by combination of energetic ion bombardment and multiphoton resonance ionization. *SPIE Proceedings*, 426 *Laser-based Ultrasensitive Spectroscopy and Detection V*, 24-31.
3. Kimock, F. M., Baxter, J. P., Winograd, N. (1983). Detection of Sputtered Neutrals by Multiphoton Resonance Ionization, *Nucl. Instrum. Meth. Phys. Res.* 218, 287-292.
4. Kimock, F. M., Baxter, J. P., Pappas, D. L., Kobrin, P. H. & Winograd, N. (1984). Solids analysis using energetic ion bombardment and multiphoton resonance ionization with time-of-flight detection. *Analytical Chemistry*, 56, 2782-2791.
5. Kimock, F. M., Baxter, J. P., Pappas, D. L., Kobrin, P. H. & Winograd, N. (1983). Examination of excited state populations in Sputtering using multiphoton resonance ionization. *Analytical Spectroscopy*, 26th Oak Ridge National Laboratory Conference on Analytical Chemistry in Energy Technology, Knoxville, TN, 179.
6. Kimock, F. M., Baxter, J. P., Pappas, D. L., Kobrin, P. H., Winograd, N. (1984). Detection of Sputtered Neutrals by Multiphoton Ionization, in *Secondary Ion Mass Spectrometry-SIMS IV*, Springer Series in Chemical Physics, 36, 62.
7. Kimock, F. M., Pappas, D. L. & Winograd, N. (1985). Matrix effects on the electronic partitioning of iron atoms desorbed from surfaces by energetic ion bombardment. *Analytical Chemistry*, 57, 2669-2674.
8. Kimock, F. M. (1985). Solids analysis using energetic ion bombardment and multiphoton resonance ionization. Ph.D. Thesis, The Pennsylvania State University, University Park, PA.
9. Pappas, D. L., Winograd, N. & Kimock, F. M. (1987). Characterization of atoms desorbed from surfaces by energetic ion bombardment using multiphoton ionization detection. in Cuomo, J. J., Rossnagel, S. M. & Kaufman, H. R. (editors) *Ion Beam Deposition, Film Modification and Synthesis*.
10. Gardner, J. M., Lester, M. I. & Kimock, F. M. (1989). Background reduction through the use of pulsed valve sampling mass spectrometry, *International Journal of Mass Spectrometry Ion Proceedings*, 91, 199-297.
11. Kimock, F. M., Hoover, D. S., Garg, D., Dyer, P. N., Iampietro, R. L., Monk, V. A. & Tsai, W. (1989). Aspects of filament-assisted deposition of polycrystalline diamond. *Electrochemistry Society Proceedings*, 89 (12) 536-540.
12. Aisenberg, S. & Kimock, F. M. (1990). in Pouch, J. & Alterovitz, S. (editors) *Properties and characterization of amorphous carbon films*. *Materials Science Forum*, 52-53, 1-39, Trans Tech Publications.
13. Knapp, B. J. & Kimock, F. M. (1992). Abrasion-resistant diamond-like carbon (DLC) films for optical applications. *Society of Vacuum Coaters 35th Annual Technical Conference Proceedings*, 174-179.
14. Kimock, F. M., Hsieh, A. J., Dehmer, P. G. & Yip, P. W. (1992). Diamond-like carbon coating: its application for polymeric substrates. in Nix, W. D., Brauman, J. C., Arzt, E. & Freund, L. B. (editors) *Thin Films: Stresses and Mechanical Properties III*, *Materials Research Society Symposium Proceedings*, 239, 647-652.
15. Hughes, T. J. & Kimock, F. M. (1993). Ion beam deposited DLC coatings: characteristics and commercial applications in optics. *Society of Vacuum Coaters*, 36th Annual Technical Conference Proceedings, 139-145.
16. Kimock, F. M. & Knapp, B. J. (1993). Commercial applications of ion beam deposited diamond-like carbon (DLC) coatings. *Surface and Coatings Technology*, 56, 273-279.
17. Daniels, B. K., Brown, D. W. & Kimock, F. M. (1997). Friction and wear performance of diamond-like carbon, boron carbide and titanium carbide coatings against glass. *Journal of Materials Research*, 12 (9) 2485-2492.
18. Grannen, K., Gui, J., Ma, X., Rauch, G., Huang, L., Brown, D., Thear, E., Kimock, F. & Finke, S. (1999). Ion beam deposition of 5-nm carbon overcoats for future recording media. *Intermag Conference*.

19. Yehoda, J. E., Taylor, J., Kimock, F. M. (2011). Highly Durable DLC Coatings for Plastic Transparencies and Optics, Soc. Vacuum Coaters 54th Ann. Tech. Conf. Proc., 261-264.
20. Gill, E. C., Antalek, J., Kimock, F. M., Nasiatka, P. J., McIntosh, B. P., Tanguay, Jr., A. R., Weiland, J. D., (2013). High-Density Feedthrough Technology for Hermetic Biomedical Micropackaging, Mat. Res. Soc. Symp. Proc. 1572, 735-741.
21. Weiland, J. D., Kimock, F. M., Yehoda, J. E., Gill, E. C., McIntosh, B. P., Nasiatka, P. J., Tanguay, Jr., A. R. (2013), *Chip-Scale Packaging for Bioelectronic Implants*, 6th Int. IEEE EMBS Conf. Neural Eng. San Diego, CA, Nov. 6-8.

Patents

1. Kimock, F.M., Phillips, J.H., inventors; Air Products and Chemicals, Inc., assignee. Apparatus and process for improved detection limits in mass spectrometry. United States patent US 4,855,594. 1989 Aug 8.
2. Karwacki, E.J. Jr., Kimock, F.M., inventors; Air Products and Chemicals, Inc., assignee. Method for determining the depth of permeation of modifier into the interior of a thermoplastic article. United States patent US 5,019,208. 1991 May 28.
3. Garg, D., Tsai, W., Iampietro, R.L., Kimock, F.M., Dyer, P.N., inventors; Diamonex, Incorporated, assignee. Diamond-on-a-substrate for electronic applications. United States patent US 5,126,206. 1992 Jun 30.
4. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,135,808. 1992 Aug 4.
5. Garg, D., Tsai, W., Iampietro, R.L., Kimock, F.M., Kelly, C.M., inventors; Diamonex, Incorporated, assignee. Hot filament chemical vapor deposition reactor. United States patent US 5,160,544. 1992 Nov 3.
6. Garg, D., Tsai, W., Kimock, F.M., Iampietro, R.L., Dyer, P.N., inventors; Diamonex, Incorporated, assignee. HFCVD method for producing thick, adherent and coherent polycrystalline diamond films. United States patent US 5,186,973. 1993 Feb 16.
7. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant polymeric substrate product. United States patent US 5,190,807. 1993 Mar 2.
8. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,268,217. 1993 Dec 7.
9. Knapp, B.J., Kimock, F.M., Finke, S.J., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,506,038. 1996 Apr 9.
10. Kimock, F.M., Knapp, B.J., Finke, S.J., Galdieri, J.V., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,508,092. 1996 Apr 16.
11. Knapp, B.J., Kimock, F.M., Petrmichl, R.H., Galvin, N.D., inventors; Diamonex, Incorporated, assignee. Ion beam process for deposition of highly abrasion-resistant coatings. United States patent US 5,508,368. 1996 Apr 16.
12. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Diamonex, Incorporated, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,527,596. 1996 Jun 18.
13. Petrmichl, R.H., Knapp, B.J., Kimock, F.M., Daniels, B.K., inventors; Monsanto Company, assignee. Highly abrasion-resistant, flexible coatings for soft substrates. United States patent US 5,618,619. 1997 Apr 8.
14. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Monsanto Company, assignee. Process of making abrasion wear resistant coated substrate product. United States patent US 5,635,245. 1997 Jun 3.
15. Kimock, F.M., Knapp, B.J., Finke, S.J., Galdieri, J.V., inventors; Monsanto Company, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,637,353. 1997 Jun 10.
16. Kimock, F.M., Knapp, B.J., Finke, S.J., inventors; Monsanto Company, assignee. Method for producing an abrasion resistant coated substrate product. United States patent US 5,643,423. 1997 Jul 1.
17. Petrmichl, R.H., Knapp, B.J., Kimock, F.M., Daniels, B.K., inventors; Monsanto Company, assignee. Highly abrasion-resistant, flexible coatings for soft substrates. United States patent US 5,679,413. 1997 Oct 21.
18. Kimock, F.M., Knapp, B.J., Finke, S.J., Galdieri, J.V., inventors; Monsanto Company, assignee. Abrasion wear resistant coated substrate product. United States patent US 5,844,225. 1998 Dec 1.
19. Knapp, B.J., Kimock, F.M., Petrmichl, R.H., Daniels, B.K., inventors; Monsanto Company, assignee. Highly durable and abrasion-resistant dielectric coating for lenses. United States patent US 5,846,649. 1998 Dec 8.

20. Petrmichl, R.H., Mahoney, L.J., Venable, R.H. 3rd, Galvin, N.D., Knapp, B.J., Kimock, F.M., inventors; Monsanto Company, assignee. Ion beam process for deposition of highly wear-resistant optical coatings. United States patent US 5,888,593. 1999 Mar 30.
21. Brown, D.W., Baylog, M., Kimock, F.M., Knapp, B.J., Petrmichl, R.H., Thear, E.G., inventors; Diamonex, Incorporated, assignee. Highly wear-resistant thermal print heads with silicon-doped diamond-like carbon protective coatings. United States patent US 6,046,758. 2000 Apr 4.
22. Knapp, B.J., Kimock, F.M., Petrmichl, R.H., Galvin, N.D., Daniels, B.K., inventors; Diamonex, Incorporated, assignee. Highly durable and abrasion-resistant dielectric coating for lenses. United States patent US 6,077,569. 2000 Jun 20.
23. Knapp, B.J., Kimock, F.M., Petrmichl, R.H., Galvin, N.D., inventors; Diamonex, Incorporated, assignee. Ion beam process for deposition of highly abrasion-resistant coatings. United States patent US RE37,294. 2001 Jul 24.
24. Giannini, R., Parkinson, J.L., Hoover, D.S., Kimock, F.M., Barkley, L.L., Kowalchuk, S.P., inventors; Jarbridge, Inc., assignee. Previewing system and method. United States patent US 7,062,454. 2006 Jun 13.
25. Kimock, F.M., Finke, S.J., Wu, R.L., inventors; Morgan Advanced Ceramics, Inc., assignee. Dielectric coating and use in capacitors. United States patent 8,030,219. 2011 Oct 4.
26. Hassanali, M., Salupo, C., Keverline, S., Kimock, F.M., inventors. Encapsulation coating to reduce particle shedding. United States patent application US 20100327699. 2009 Aug 13.
27. Bealka, D.J., Vaillancourt, C.M., Kimock, F.M., Gill, E.C., inventors; Morgan Advanced Ceramics, Inc., assignee. Co-fired metal and ceramic composite feedthrough assemblies for use at least in implantable medical devices and methods for making the same. United States patent 8,698,006, 2014 Apr 15.
28. Kimock, F.M., Rambo, Z., Kimock, B.J., Unger, A., Thear, E.G., Thear, G.H., inventors; Neatcap, LLC assignee. Medical Headgear. US Pat. Appl. 14/625,325 filed Feb. 19, 2015.
29. Kimock, F.M., Rambo, Z., Thear, E.G., Thear, G.H., Whalen, J.J., inventors; Neatcap, LLC assignee. Medical Headgear. US Pat. Appl. 15/881,111 filed Jan. 26, 2018.

D. Research Support

Recent Research Support

Weiland (PI) 03/01/12-01/31/15

DARPA

Biocompatible Hermetic Coatings, High Density Feedthroughs, and Hermeticity Test Chips for Implantable Biomedical Devices

The major goal of this research was to investigate novel technology for protecting implantable microelectronics.

Role: Co-Investigator, Morgan Advanced Ceramics Program Manager.