

<b>CME Faculty Patents</b>	
	<b>List of Patents</b>
<b>Robert Barat</b>	<ol style="list-style-type: none"> <li>1. "Terahertz Imaging System Method"- with John Federici and Dale Gary - US Patent # 6,815,683</li> </ol>
<b>Sagnik Basuray</b>	<ol style="list-style-type: none"> <li>1. Shubhra Gangopadhyay, Venu Korampally, Sagnik Basuray, Kunal Bhatnagar, Avinash Pathak, Arnab Ghosh, Drew Edwin Menke, Joseph Mathai, Peter Cornish, Keshab Gangopadhyay, Aaron Wood, Nano-gap grating devices with enhanced optical properties and methods of fabrication, Patent Number 10073200</li> <li>2. Hsueh-Chia Chang, Peter Mushenheim, Sagnik Basuray, Gilad Yossifon, Satyajyoti Senapati; Microchamber electrochemical cell having a nanoslot, patent Mo: 8969007</li> <li>3. Hsueh-Chia Chang, Jason Gordon, Satyajyoti Senapati, Zachary Gagnon, Sagnik Basuray, Microfluidic platforms for multi-target detection, Patent Number 8771938</li> <li>4. Chiu Tai Andrew Wong, Gianni Calogero Ferreri, Sagnik Basuray, Arthika Bappal, Suresh Gopalkrishna Shenoy, Xavier Victor Gomes, System and Method for Operation of Isfet Arrays Using pH Inert Reference Sensors, Application Number: 13/970,167</li> </ol>
<b>Ecevit Bilgili</b>	<ol style="list-style-type: none"> <li>1. Systems and Methods for Superdisintegrant-Based Composite Particles for Dispersion and Dissolution of Agents, US 9,452,107, issued September 27, 2016. (Inventors: Ecevit Bilgili, Rajesh Dave, Anagha Bhakay, Mohammad Azad)</li> <li>2. Process for recycling of rubber materials, US 5,904,855 issued May 18, 1999. (Inventors: Hamid Arastoopour, Daniel A, Shocke, Barry Bernstein, Ecevit Bilgili)</li> <li>3. Apparatus and Process for Pulverization of a Polymeric material, US 6,513,737 issued February 04, 2003. (Inventors: George Ivanov, Hamnid Arastoopour, Ecevit Bilgili, Nima Shahidi, Barry Bernstein)</li> </ol>

	<ol style="list-style-type: none"><li data-bbox="868 191 1396 367">4. Pharmaceutical Core-Shell Composite Powder and Processes for Making the Same , US 9,801,820, issued on October 31, 2017. (Inventors: R. N. Davé, C. Knieke, D. To, E. Bilgili, M. Azad)</li><li data-bbox="868 367 1396 583">5. Methods for Superdisintegrant-Based Composite Particles for Dispersion and Dissolution of Active Pharmaceutical Agents, US 9,931,300, Issued on April 3, 2018. (Inventors: E. Bilgili, R. N. Davé, A. Bhakay, M. Azad)</li></ol>
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**Raj Dave**

1. Method of Particle Coating , US 6,197,369, Issued March 6, 2001. (filed: Sept. 30, 1999) (Inventors: S. Watano, R. Pfeffer, R. Dave)
2. Method and Apparatus for Magnetically Mediated Controlled Powder Discharge , US 6,471,096, Issued October 29, 2002. (Inventor: R. Dave)
3. Polymer Coating/Encapsulation of Nanoparticles Using a Supercritical Antisolvent Process, US 7,537,803 B2, Issued May 26, 2009. (Inventors: Yulu Wang, R. Pfeffer, R. Dave)
4. System and Method for Nanoparticle and Nanoagglomerate Fluidization , US 7,658,340 B2, Issued Feb 9, 2010. (Inventors: R. Pfeffer, C. Nam, R. Dave, Q. Liu, J. Quevedo, Q. Yu)
5. Fractal Structured Nanoagglomerates as Filter Media , US 7,645,327, Issued January 12, 2010. (Inventors: Robert Pfeffer, Rajesh Dave, Stanislav Dukhin, Jose Quevedo, Qun Yu)
6. Net Shaping Manufacturing Processes and Compositions, PCT/US2004/036528, US 8,163,114, Issued on 4/24/2012. (Inventors: Costas G. Gogos, Robert Pfeffer, Theodore Davidson, Rajesh N. Dave, Ming-Wan Young, Banian Qian)
7. Continuous High Speed Coating of Finely Ground Particles, US 8,252,370, Issued on August 28, 2012. (Inventors: Ming-Wan Young, Costas George Gogos, Jun Yang, Rajesh Dave, Linjie Zhu, Peter Bonnett, William Schepige)
8. Taste masked active pharmaceutical powder compositions and processes for making them, US 9,993,041 B2 and foreign counter-parts, issued March 31, 2015. (Inventors: Daniel To, Rajesh N. Davé)
9. Solventless Mixing Process for Coating Pharmaceutical Ingredients, US 9,107,851 and foreign counterparts, issued August 18, 2015. (Inventors: Rajesh N. Dave, Maxx W. Capece, Daniel To)
10. Systems and Methods for Superdisintegrant-Based Composite

	<p>Particles for Dispersion and Dissolution of Agents, US 9,452,107, issued September 27, 2016. (Inventors: Ecevit Bilgili, Rajesh Dave, Anagha Bhakay, Mohammad Azad)</p> <p>11. A Solvent-Less Acoustic Mixing Based Process for Polymer Coating Active Pharmaceutical Ingredients, Japanese Patent 6,159,504, issued June 16, 2017. (Expiration date, 09-10-2033) (Inventors: Rajesh N. Dave, Maxx W. Capece, Daniel To)</p> <p>12. A Process of Preparing Engineered Composite Particles and Applying a Bi-Layer Coating by a Fluidized Bed Process, Japanese Patent No. 6,166,859, issued June 30, 2017. (Expiration date, 09-10-2033) (Inventors: Rajesh N. Dave, Maxx W. Capece, Daniel To)</p> <p>13. Pharmaceutical Core-Shell Composite Powder and Processes for Making the Same , US 9,801,820, issued on October 31, 2017. (Inventors: R. N. Davé, C. Knieke, D. To, E. Bilgili, M. Azad)</p> <p>14. Methods for Superdisintegrant-Based Composite Particles for Dispersion and Dissolution of Active Pharmaceutical Agents, US 9,931,300, Issued on April 3, 2018. (Inventors: E. Bilgili, R. N. Davé, A. Bhakay, M. Azad)</p> <p>15. Solventless Mixing Process for Coating Pharmaceutical Ingredients, Chinese Patent, ZL2013800539275, issued June 22, 2018. (for International Application No. PCT/US2013/064058; Inventors: Rajesh N. Dave, Maxx W. Capece, Daniel To)</p>
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<p><b>Edward Dreizin</b></p>	<ol style="list-style-type: none"> <li>1. Dreizin, E.L., Schoenitz, M., "Nano-composite energetic powders prepared by arrested reactive milling", US Patent 7,524,355 B2 April 28, 2009</li> <li>2. Dreizin, E.L. and Felder, W., "Process and Apparatus for Micro-Arc Welding" US Patent 5,616,258 (1997)</li> <li>3. Suslov A.V., and Dreizin, E.L., Pozigun, S.A., "Method of Producing Metal Powders," SU 1629160 A1, B22F9/14, (1992)</li> <li>4. Suslov A.V., and Dreizin, E.L., "Method of Producing Spherical Metal Granules," SU 1627327 A1, B22F9/14 (1991)</li> </ol>
<p><b>Murat Guvendiren</b></p>	<ol style="list-style-type: none"> <li>1. Murat Guvendiren, Shen Ji, "Additive manufacturing of 3D scaffolds and devices with embedded channels". U.S. Application No. 62/715,869 (August 2018).</li> <li>2. Kenneth R. Shull, Murat Guvendiren, Phillip B. Messersmith, Bruce P. Lee. "Modified acrylic block copolymers for hydrogels and pressure sensitive wet adhesives". US Patent 7,943,703, issued 2011.</li> <li>3. Kenneth R. Shull, Murat Guvendiren, Phillip B. Messersmith, Bruce P. Lee. "Modified acrylic block copolymers for hydrogels and pressure sensitive wet adhesives". US Patent 7,732,539, issued 2010.</li> <li>4. 1. Kenneth R. Shull, Murat Guvendiren, Phillip B. Messersmith, Bruce P. Lee. "Modified acrylic block copolymers for hydrogels and pressure sensitive wet adhesives". US Patent 7,635,737, issued 2009</li> </ol>

<p><b>Boris Khusid</b></p>	<ol style="list-style-type: none"> <li>1. Khusid, B., Elele, E., Shen, Y., Lei, Q., Guerra, K.L., Leitz, F. Method and device for testing the effectiveness of magnetic treatment of feed water for reducing mineral scaling in reverse osmosis processes. U.S. Non-provisional Patent Application No. 15/851,776; 12/22/2017; claiming priority to the provisional application No. 62/437,939; 12/22/2016</li> <li>2. James, C.D., Khusid, B., Kumar, A., Acrivos, A., Microfluidic device for the assembly and transport of microparticles, US Patent 7,744,737, 2010-06-29</li> <li>3. Merzhanov A.G., Borovinskaya, I.P., Shulman, Z.P., Khusid, B.M., Stolin A.M., Podlesov, V.V., Kulebyakin, V.V., Karpechenko, A.V., Demidkov, S.V., Method of manufacturing articles from composite materials, RU 2010678 (C1), 1994-04-15</li> <li>4. Voroshnin, L.G., Khusid, B.M., Borisov, Y.G., Vashchev, S.E, Lomako, A.V., Khina, B.B., Method of making coatings on articles of titanium and its alloys, SU 1525234 (A1), 1989-11-30</li> <li>5. Voroshnin, L.G., Khusid, B.M., Borisov, Y.G., Lomako, A.V., Khina, B.B., Golodnitskij, A.M., Pulverulent composition for aluminizing steel articles, SU 1502657 (A1), 1989-08-23,</li> <li>6. Gorodkin, S.R., Zaltsgendler, E.A., Kordonskij, V.I., Prokhorov, I.V., Khusid, B.M., Shulman, Z.P., Method of measuring viscosity of liquid, SU 1394107 (A1), 1988-05-07</li> <li>7. Anaskin I.F., Gleb, V.K., Korobko, E.V., Ragotner, M.M., Khizhinskij, B.P., Khusid, B.M., Shulman, Z.P., Method of controlling system elastic parameters, SU 1116242 (A1), 1984-09-30</li> <li>8. Shulman, Z.P., Kordonskij, V.I., Khusid, B.M., Kunevich, T.V., Kuzmin, V.A., Liquid longitudinal viscosity measuring method, SU 1046655 (A1), 1983-10-07</li> <li>9. Shulman Z.P., Postnikov, V.M., Novichenok, L.N., Belskaya, E.P., Kozlov, N.M., Ovchinnikova, S.M., Marshak, V.A., Khusid, B.M., Fedorova, V.A., Mixture component concentration determination method, SU 1002928 (A1), 1983-03-07</li> </ol>
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**Kamalesh Sirkar**

1. 1."Preparation of Improved Flat Semipermeable Membrane of Cellulose Acetate for Reverse Osmosis Separation of Water and Other Solvents from Solutions," K.K. Sirkar and G. Pandu Rangaiah, Indian Patent Application No. 1243/Cal/76-G of July 9, 1976. Serial No. 141391. Patent Granted.
2. 2."Selective Permeation Gas-Separation Processes and Apparatus," K.K. Sirkar, U.S. Patent No. 4,750,918, June 14, 1988
3. 3."Selective Permeation Gas-Separation Processes and Apparatus," K.K. Sirkar, Canada Patent No. 1,266,367, March 6, 1990.
4. "Immobilized Interface Solute Transfer Apparatus," K.K. Sirkar, U.S. Patent 4,789,468, December 6, 1988. Reissued: US Patent Re. 34,828, January 17, 1995.
5. "Immobilized Interface Solute Transfer Apparatus," K.K. Sirkar, Canada Patent No. 1,271,428, July 10, 1990.
6. "Immobilized Interface Solute-Transfer Process," K.K. Sirkar, U.S. Patent 4,997,569, March 5, 1991.
7. "Immobilized Liquid Membrane," K.K. Sirkar, R.R. Bhave, H. Taskier and M. Ostler, U.S. Patent No. 4,973,434, November 27, 1990.
8. "Asymmetrically-Wettable Porous Membrane Process," K.K. Sirkar, U.S. Patent 4,921,612, May 1, 1990.
9. "Asymmetrically-Wettable Porous Membrane," K.K. Sirkar, U.S. Patent 5,053,132, October 1, 1991
10. "Asymmetrically-Wettable Porous Membrane and Membrane Process," Canada Patent 1,295,795, Feb. 18, 1992.
11. "Immobilized Liquid Membrane," K.K. Sirkar, R.R. Bhave, H.T. Taskier and M.I. Ostler, U.S. Patent 5,110,326, May 5, 1992.
12. "Improved Hollow Fiber Immobilization," K.K. Sirkar and R.K. Shukla, U.S. Patent 5,510,257, April 23, 1996.
13. "Hollow Fiber Contained Liquid Membrane Pervaporation for Removal of Volatile Organic Compounds from

	<p>Aqueous Solutions," K.K. Sirkar, D. Yang, S. Majumdar, S. Kovenklioglu and A. Sengupta, U.S. Patent 5,637,224, June 10, 1997.</p> <ol style="list-style-type: none"><li>14. "Method for Solvent Extraction Using a Dual-skinned Asymmetric Microporous Membrane," B.W. Reed and K.K. Sirkar, US Patent 5,714,072, Feb. 3, 1998.</li><li>15. "Method and Apparatus for Selectively Removing a Component from a Multicomponent Gas/Vapor Mixture," K.K. Sirkar and JY.R. Li, US Patent 5,753,009, May 19, 1998.</li><li>16. "Novel Controlled Release Device and Method Based on Aqueous-Organic Partitioning in Porous Membranes," K.K. Sirkar, S. Farrell and R. Basu, US Patent 5,858,385, Jan. 12, 1999.</li><li>17. "Method and Apparatus for Extraction and Recovery of Ions from Solutions," K.K. Sirkar, Z-F. Yang and A.K. Guha, US Patent 5,868,935, February 9, 1999.</li><li>18. "Method and Apparatus for Gas Removal by Cyclic Flow Swing Membrane Permeation," K.K. Sirkar, US Patent 5,928,409, July 27, 1999.</li><li>19. "Apparatus and Process for Selectively Removing a Component from a Multicomponent Aqueous Solution by Pervaporation," K.K. Sirkar, US Patent 5,993,515, November 30, 1999.</li><li>20. "Chromatographic Method for Biomolecule Purification using a Hollow-Fiber Membrane Module," Robert G. Luo and Kamalesh K. Sirkar, US Patent 6,022,477, February 8, 2000.</li><li>21. "Controlled Release Device Based on Aqueous-Organic Partitioning in Porous Membranes", K. Sirkar, S. Farrell and R. Basu, US Patent 6,110,481, August 29, 2000.</li><li>22. "Gas Separation Using Hollow Fiber Contained Liquid Membrane," K.K. Sirkar, U.S. Patent 6,156,096 December 5, 2000.</li><li>23. "Apparatus for Removal of Volatile Organic Compounds from Gaseous Mixtures," K.K. Sirkar, S. Majumdar and T.</li></ol>
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	<p>Poddar, U.S. Patent 6,165,253, December 26, 2000.</p> <ol style="list-style-type: none"><li>24. "Improved Membrane Separation of Carbon Dioxide", K.K. Sirkar, A.S. Kovvali and H. Chen; U.S. Patent 6,635,103, October 21, 2003.</li><li>25. "Preparation of Microporous Films from Immiscible Blends via Melt Processing and Stretching", C. Chandavasu, M. Xanthos, K. Sirkar; U.S. Patent 6,824,680, November 30, 2004.</li><li>26. "Method and Apparatus for Isolation and Purification of Biomolecules", K.K. Sirkar, R.G. Luo, Y. Xu and X.P. Dai, U.S. Patent 6,986,847, January 17, 2006.</li><li>27. "Systems and Methods for Selective Separation of Gaseous Mixtures Using Hollow Fibers", K.K. Sirkar, U.S. Patent 7,318,854, January 15, 2008.</li><li>28. "Highly Selective Membrane Systems and Methods for Use in Protein Ultrafiltration", K.K. Sirkar and M. Feins, US Patent 7,497,950, March 3, 2009.</li><li>29. "Solid Hollow Fiber Cooling Crystallization Systems and Methods", K.K. Sirkar, and D. Zarkadas, US Patent 7,754,083,B2, July 13, 2010.</li><li>30. "Antisolvent Crystallization in Porous Hollow Fiber Devices and Methods of Use Thereof", K.K. Sirkar and D. Zarkadas, US Patent 7,811,381, October 12, 2010.</li><li>31. "Iontophoretic Transdermal Drug Delivery System based on Conductive Polyaniline Membrane", US Patent 8,036,738 B2, October 11, 2011.</li><li>32. "Desalination Devices and Systems using Porous Hydrophobic Hollow Fibers and Hydrophobic Porous Coatings," K.K. Sirkar and B. Li, US Patent 8,167,143 B2, May 1, 2012.</li><li>33. "Pervaporation Membranes Highly Selective for Volatile Solvents Present in Fermentation Broths", K.K. Sirkar, US Patent 9,085,476 B2, July 21, 2015.</li><li>34. "System and Method for Continuous Polymer Coating of Particles", Sirkar, K.</li></ol>
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K., Pfeffer, R., Singh, D., and Chen, D. US Patent 9,452,930, September 27, 2016.

35. "Systems and Methods for CO2 Removal from Flue Gas by Temperature Swing Absorption", K. K. Sirkar, US Patent 9,751,042 B2, Sep.5, 2017.
36. "System and Method for Continuous Removal of Water from Oil via Membrane Separation", K.K. Sirkar and Li Yang, US Patent
37. "Porous Hollow Fiber Anti-Solvent Crystallization-based Continuous Method of Polymer Coating on Submicron and

<b>Roman Voronov</b>	<ol style="list-style-type: none"><li>1. A provisional patent was submitted to the US government on December 2017. Attorney Docket No.: 094350-00197 Title: "Systems for Addressable Microfluidic Valves and Related Methods of Manufacturing ". Roman Voronov, Quang Long Pham and Anh Tong</li></ol>
<b>Xiaoyang Xu</b>	<ol style="list-style-type: none"><li>1. Xiaoyang Xu, Yung-Hao Tsou. Photoluminescent hydrogel; U.S application No 15/702923; filed in September 2016</li><li>2. "Nanoparticle Depots for Controlled and Sustained Gene Delivery" has been filed as a provisional patent application.</li><li>3. "Photoluminescent Hydrogel" has been allowed.</li></ol>

**Irina Molodetsky**

1. Integrated Coupling of Scintillation Crystal with Photomultiplier in a Detector Apparatus\_Publication number: 20180210095 Type: Application US14/355,762 Filed: January 5, 2018. Publication date: July 26, 2018 Inventors: Ken Stephenson, Peter Wraight, Wolfgang Ziegler, John J. Simonetti, Christian Stoller, Irina Molodetsky
2. Boron Nitride Nanotubes (BNNT) in Polymers for Extreme Environment Publication number: 20180180760. Type: Application Filed: December 28, 2016 Publication date: June 28, 2018 Inventors: Irina Shestakova, Olivier Philip, Irina Molodetsky
3. Integrated coupling of scintillation crystal with photomultiplier in a detector apparatus .Patent number: 9880295 Type: Grant, Filed: October 28, 2011. Date of Patent: January 30, 2018 Assignee: SCHLUMBERGER TECHNOLOGY CORPORATION Inventors: Ken Stephenson, Peter Wraight, Wolfgang Ziegler, Christian Stoller, Irina Molodetsky, John J. Simonetti, Donna Simonetti
4. Charged Particle Emitter Assembly for Radiation Generator. Publication number: 20170276826 Type: Application Filed: March 24, 2017 Publication date: September 28, 2017 Inventors: Jani Petteri Reijonen, Irina Molodetsky, Joel Mark Wiedemann
5. Method For Forming Lanthanide Scintillators. Publication number: 20160138383 Type: Application, Filed: June 24, 2014. Publication date: May 19, 2016, Inventor: Irina MOLODETSKY
6. Ion source having increased electron path length Patent number: 8822912 Type: Grant Filed: December 19, 2012 Date of Patent: September 2, 2014 Assignee: Schlumberger Technology Corporation Inventors: Jani Reijonen, Irina Molodetsky, Kenneth E. Stephenson

	<p>7. Ion source employing secondary electron generation. Patent number: 8779351 Type: Grant, Filed: December 19, 2012 Date of Patent: July 15, 2014. Assignee: Schlumberger Technology Corporation. Inventors: Jani Reijonen, Irina Molodetsky, Kenneth E. Stephenson</p>
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