

# Devrim Kilinc

INSERM U1167 – University of Lille – Institut Pasteur de Lille  
Risk Factors and Molecular Determinants of Aging-Related Diseases  
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## Education

|   |         |
|---|---------|
| HDR, Neuroscience, Université de Lille, Lille, France                                 | 09/2020 |
| Ph.D., Biomedical Engineering, Drexel University, Philadelphia, PA                    | 03/2008 |
| M.S., Biomedical Engineering, Bogazici University, Istanbul, Turkey                   | 06/2003 |
| B.S., Mechanical Engineering (ABET accredited), Bogazici University, Istanbul, Turkey | 06/2001 |

## Research Experience and Funding History

|  |                   |
|--|-------------------|
| Inserm U1167 – Institut Pasteur de Lille – Université de Lille   | Lille, France     |
| Research Scientist (tenured)   | 06/2019 – Present |
| ➤ Obtained the Institut Pasteur de Lille Transdisciplinary Research Projects 2022 grant (with M Gissot; €100K; 2 yrs) to decipher the consequences of <i>Toxoplasma gondii</i> infection on neuron activity.   |                   |
| ➤ Obtained Alzheimer’s Association Research Grant 2022 (\$150K over 3 years) to screen Alzheimer’s disease genetic risk factors for their capacity to block synaptotoxicity and to functionally validate hit genes.  |                   |
| ➤ Obtained CPER-CTRL collaborative grant 2019 (with S Halliez; €200K; 2 yrs) from IPL Transdisciplinary Research Center on Longevity to develop a medium-throughput screening based on microfluidic co-culture devices for synapse toxicity.               |                   |
| ➤ Obtained Sanofi iAwards Europe 2019 grant (€100K; 1 yr) to study Tau-induced synaptotoxicity in co-culture devices.  |                   |
| Postdoctoral Researcher (PI: Jean-Charles Lambert)   | 06/2016 – 06/2019 |
| ➤ Obtained pilot grant (€40K; 2 yrs) from Fondation Vaincre Alzheimer to study role of Pyk2/p53 signalling in synapses.  |                   |
| UCD Nanomedicine Centre, University College Dublin   | Dublin, Ireland   |
| Research Fellow (PI: Gil U. Lee)   | 09/2013 – 03/2016 |
| ➤ Filed a patent as the lead inventor microfluidic device that generates dual concentration gradients. Secured the Enterprise Ireland Commercial Case Feasibility Support Grant (€9.4K). Contributed to another patent from Lee Laboratory as co-inventor. |                   |
| Bionanosciences Laboratory, University College Dublin  | Dublin, Ireland   |
| Marie Curie Fellow (PI: Gil U. Lee)  | 09/2011 – 09/2013 |
| ➤ Obtained the Marie Curie Intra-European Fellowship (€194.8K) and a microfabrication project grant from Tyndall National Institute (SFI National Access Programme with GU Lee).   |                   |
| ➤ Wrote a successful proposal for AXA Research Fund Doctoral Fellowship application (€120K for A Blasiak).   |                   |
| Postdoctoral Researcher (PI: Gil U. Lee)   | 03/2010 – 09/2011 |
| Neurobiology of Adaptive Processes Laboratory, Université Pierre et Marie Curie  | Paris, France     |
| Postdoctoral Researcher (PIs: Bernard Brugg and Jean-Michel Peyrin)  | 03/2008 – 12/2009 |
| Cellular Mechanics Laboratory, Drexel University   | Philadelphia, PA  |
| Research and Teaching Assistant (PIs: Kenneth A. Barbee and Gianluca Gallo)  | 10/2003 – 03/2008 |
| ➤ Teaching assistant for ‘Biomeasurements’ and ‘Biomechanics’ laboratory classes.  |                   |
| ➤ Received a Critical Research Fellowship from Drexel Synergy Grant (2005–2006) and a Research Fellowship from Drexel Neuroengineering Major Research Initiative (2007–2008).  |                   |

## Book Chapters

Blasiak A\*, **D Kilinc\*** and JM Peyrin\*. “Subcellular compartmentalization for neurobiology: Focusing on the axon,” in Handbook of Neuroengineering (NV Thakor, ed), Nov 2021, DOI: [10.1007/978-981-15-2848-4\\_1-1](https://doi.org/10.1007/978-981-15-2848-4_1-1) (\* co-corresponding)

Lee GU, K Ivanov, **D Kilinc**, E Martines, A Blasiak, P Li and M Higgins. “Characterization of intermolecular and intramolecular interactions with the atomic force microscope,” Handbook of Imaging in Biological Mechanics (C Neu and G Genin, editors), Oct 2014, [445-56](https://doi.org/10.1007/978-981-15-2848-4_445-56)

## Peer-Reviewed Journal Articles

Total number of citations: 1239; *H*-index: 20; average journal impact factor: 7.4; ORCID 0000-0003-3321-5203

- Gomez-Murcia V, A Launay, K Carvalho, A Burgard, C Meriaux, R Caillierez, S Eddarkaoui, **D Kilinc**, D Siedlecki, M Besegher, S Bégard, B Thiroux, M Jung, O Nebie, M Wisztorski, N Déglon, C Montmasson, AP Bemelmans, M Hamdane, T Lebouvier, D Vieau, I Fournier, L Buee, S Lévi, LV Lopes, AL Boutillier, E Faivre and D Blum. “Neuronal A2A receptor exacerbates synapse loss and memory deficits in APP/PS1 mice,” *Brain*, 2024 (in press)
- Saha O, AR Melo de Farias, A Pelletier, D Siedlecki-Wullich, B Soares Landeira, J Gadaut, A Carrier, AC Vreulx, K Guyot, Y Shen, A Bonnefond, P Amouyel, J TCW, **D Kilinc**, CM Queiroz, F Delahaye, JC Lambert and MR Costa, “The Alzheimer’s disease risk gene BIN1 regulates activity-dependent gene expression in human-induced glutamatergic neurons,” *Mol Psychiatry*, 2024 (in press), DOI: [10.1038/s41380-024-02502-y](https://doi.org/10.1038/s41380-024-02502-y)
- Lefebvre C, AC Vreulx, C Dumortier, S Bégard, C Gelle, D Siedlecki-Wullich, M Colin, **D Kilinc\*** and S Halliez\*, “Integration of microfluidic devices with microelectrode arrays to functionally assay amyloid- $\beta$ -induced synaptotoxicity,” *ACS Biomater Sci Eng*, 2024 (in press) DOI: <https://doi.org/10.1021/acsbiomaterials.3c00997> (\* co-corresponding)

4. Coulon A, D Siedlecki-Wullich, C Najdek, C Gelle, AM Ayril, F Demiautte, E Lambert, A Vandeputte, P Brodin, T Mendes, JC Lambert, **D Kilinc**, J Dumont and J Chapuis, "High-content screening of synaptic density modulators in primary neuronal cultures," *Curr Protoc Cell Biol*, 2023, [3:e904](#)
5. Eysert F, A Coulon, E Boscher, AC Vreulx, A Flaig, T Mendes, S Hughes, B Grenier-Boley, X Hanouille, F Demiautte, M Martinen, M Takalo, P Amouyel, S Desai, I Pike, M Hiltunen, F Chécler, M Farinelli, C Delay, N Malmanche, SS Hébert, J Dumont, **D Kilinc**, JC Lambert and J Chapuis, "Alzheimer's genetic risk factor FERMT2 (Kindlin-2) controls axonal growth and synaptic plasticity in an APP-dependent manner," *Mol Psychiatry*, 2021, [26:5592](#)
6. **Kilinc D\***, AC Vreulx, T Mendes, A Flaig, D Marques-Coelho, M Verschoore, F Demiautte, P Amouyel, Neuro-CEB Brain Bank, F Eysert, P Dourlen, J Chapuis, MR Costa, N Malmanche, F Checler and JC Lambert\*, "Pyk2 overexpression in postsynaptic neurons blocks amyloid  $\beta_{1-42}$ -induced synaptotoxicity in a microfluidic co-culture model." *Brain Commun*, 2020, [2:fcaa139](#) (\* co-corresponding)
7. Mendes T, A Herledan, F Leroux, B Déprez, JC Lambert, **D Kilinc**. "High-content screening using proximity ligation assay in primary neurons cultured in 384-well plates," *Curr Protoc Cell Biol*, 2019, [86:e100](#)
8. Sartori M, T Mendes, S Desai, A Lasorsa, A Herledan, N Malmanche, P Mäkinen, M Martinen, I Malki, J Chapuis, A Flaig, AC Vreulx, M Ciancia P Amouyel, F Leroux, B Déprez, FX Cantrelle, D Maréchal, L Pradier, M Hiltunen, I Landrieu, **D Kilinc\***, Y Herault\*, J Laporte\* and JC Lambert\*. "BIN1 recovers tauopathy-induced long-term memory deficits in mice and interacts with Tau through Thr348 phosphorylation," *Acta Neuropathol*, 2019, [138:631](#) (\* co-last)
9. Dourlen P, **D Kilinc**, N Malmanche, J Chapuis and JC Lambert. "The new genetic landscape of Alzheimer's disease: from amyloid cascade to genetically driven synaptic failure hypothesis?," *Acta Neuropathol*, 2019, [138:221](#)
10. **Kilinc D**. "The emerging role of mechanics in synapse formation and plasticity," *Front Cell Neurosci*, 2018, [12:483](#)
11. Lesniak A\*, **D Kilinc\***, A Blasiak, G Galea, JC Simpson and GU Lee. "Dynein-mediated axonal retrograde transport of nanoparticles in primary neurons depends on particle charge and lysosomal avoidance," *Small*, 2018, [1803758](#) (\* co-first)
12. **Kilinc D\***, A Blasiak, A Al-Adli, NC Carville, MA Baghban, RM Al-Shammari, JH Rice, GU Lee\*, K Gallo\* and BJ Rodriguez\*. "Charge and topography patterned lithium niobate provides physical cues to fluidically isolated cortical axons," *Appl Phys Lett*, 2017, [110:053702](#) (\* co-corresponding)
13. Blasiak A, **D Kilinc\*** and GU Lee\*. "Neuronal cell bodies remotely regulate axonal growth response to localized Netrin-1 treatment via second messenger and DCC dynamics," *Front Cell Neurosci*, 2017, [10:298](#) (\* co-corresponding)
14. **Kilinc D**, CL Dennis and GU Lee. "Bio-nano-materials for localized mechanochemical stimulation of cell growth and death," *Adv Mater*, 2016, [28:5672-80](#)
15. **Kilinc D**, J Schwab, S Rampini, OW Ikpekha, A Thampi, A Blasiak, P Li, R Schwamborn, W Kolch, D Matallanas and GU Lee. "A microfluidic dual gradient generator for conducting cell-based drug combination assays," *Integr Biol*, 2016, [8:39-49](#) (selected as 'hot paper' by reviewers)
16. Blasiak A, GU Lee\* and **D Kilinc\***. "Neuron sub-populations with different elongation rates and DCC dynamics exhibit distinct responses to isolated Netrin-1 treatment," *ACS Neuro*, 2015, [6:1578-90](#) (journal cover; \* co-corresponding)
17. **Kilinc D**, A Blasiak and GU Lee. "Microtechnologies to study the role of mechanics in axon growth and guidance," *Front Cell Neurosci*, 2015, [9:282](#)
18. Rampini S, **D Kilinc**, P Li, C Monteil, D Gandhi and GU Lee. "Micromagnet arrays for on-chip focusing, switching, and separation of superparamagnetic beads and single cells," *Lab Chip*, 2015, [15:3370-9](#)
19. **Kilinc D**, A Blasiak, JJ O'Mahony and GU Lee. "Low piconewton towing of CNS axons against diffusing and surface-bound repellents requires the inhibition of motor protein-associated pathways," *Sci Rep*, 2014, [4:7128](#)
20. **Kilinc D\***, A Lesniak\*, SA Rashdan, D Gandhi, A Blasiak, PC Fannin, A von Kriegsheim, W Kolch and GU Lee. "Mechanochemical stimulation of MCF7 cells with rod-shaped Fe-Au Janus particles induces cell death through paradoxical hyperactivation of ERK," *Adv Health Mater*, 2015, [4:395-404](#) (\* co-first).
21. Lesniak A\*, **D Kilinc\***, SA Rashdan, A von Kriegsheim, B Ashall, D Zerulla, W Kolch and GU Lee. "In vitro study of the interaction of heregulin functionalized magnetic-optical nanorods with MCF7 and MDA-MB-231 cells," *Farad Discuss*, 2014, [175:189-201](#) (\* co-first).
22. **Kilinc D** and GU Lee. "Advances in magnetic tweezers for single molecule and cell biophysics," *Integr Biol*, 2014, [6:27-34](#) (one of top ten most accessed *Integr Biol* articles in 2014; also selected as 'hot paper' by reviewers)
23. Stoeckli ET, **D Kilinc**, B Kunz, S Kunz, GU Lee, E Martines, C Rader and D Suter. "Analysis of cell-cell contact mediated by Ig superfamily cell adhesion molecules," *Curr Protoc Cell Biol*, 2013, [61:9.5.1-9.5.85](#)
24. Magnifico S, L Saias, B Deleglise, **D Kilinc**, E Duplus, MC Miquel, JL Viovy, B Brugg and JM Peyrin. "NAD<sup>+</sup> acts on mitochondrial SirT3 to prevent axonal caspase activation and axonal degeneration," *FASEB J*, 2013, [27:4712-22](#)
25. Li P, **D Kilinc**, YF Ran and GU Lee. "Flow enhanced non-linear magnetophoretic separation of beads based on magnetic susceptibility," *Lab Chip*, 2013, [13:4400-8](#)
26. O'Mahony JJ, M Platt, **D Kilinc** and GU Lee. "Synthesis of superparamagnetic particles with tunable morphologies: the role of nanoparticle-nanoparticle interactions," *Langmuir*, 2013, [29:2546-53](#)
27. **Kilinc D**, A Blasiak, JJ O'Mahony, DM Suter and GU Lee. "Magnetic tweezers-based force clamp reveals mechanically distinct apCAM domain interactions," *Biophys J*, 2012, [103:1120-9](#)
28. **Kilinc D**, JM Peyrin, V Soubeyre, S Magnifico, L Saias, JL Viovy and B Brugg. "Wallerian-like degeneration of central neurons after mass axotomy in a novel three-compartmental microfluidic chip," *Neurotox Res*, 2011, [19:149-61](#)
29. **Kilinc D**, G Gallo and KA Barbee. "Mechanical membrane injury induces axonal beading through localized activation of calpain," *Exp Neurol*, 2009, [219:553-61](#)
30. **Kilinc D**, G Gallo and KA Barbee. "An interactive image processing and analysis algorithm for the quantification of axonal beading," *Comput Meth Prog Bio*, 2009, [95:62-71](#)

31. **Kilinc D**, G Gallo and KA Barbee. “Poloxamer 188 blocks mechanoporation-induced axonal beading and cytoskeletal damage,” *Exp Neurol*, 2008, [212:422-30](#)

#### Peer-Reviewed Conference Proceedings

1. Peyrin JM, L Saias, P Gougis, S Magnifico, S Betuing, **D Kilinc**, JL Viovy and B Brugg, “Microfluidic chips with ‘axon diodes’ for directed axonal outgrowth and reconstruction of complex live neural networks,” Proceedings of  $\mu$ TAS 2008, pp. [1329-31](#), Oct 12-16, 2008, San Diego, CA
2. Sasoglu FM, **D Kilinc**, K Allen, and B Layton, “Parallel force measurements in cell arrays,” Proceedings of the ASME IMECE, pp. [855-9](#), November 11-15, 2007, Seattle, WA
3. **Kilinc D**, G Gallo, and KA Barbee, “Poloxamer 188 reduces axonal beading following mechanical trauma to cultured neurons,” Proceedings of EMBC 2007, pp. [5395-8](#), Aug 23-26, 2007, Lyon, France
4. Sasoglu FM, **D Kilinc**, K Allen, and B Layton, “Towards a method for printing a network of chick forebrain neurons for biosensor applications,” Proceedings of EMBC 2007, pp. [4092-5](#), Aug 23-26, 2007, Lyon, France
5. **Kilinc D**, G Gallo, and KA Barbee, “Effects of shear stress injury on the morphology and structure of cultured chick forebrain neurons,” Proceedings of the BIYOMUT 2005, pp. 191-6, May 25-26, 2005, Istanbul, Turkey

#### Patents

- Kilinc D**, P Li, GU Lee, D Gandhi and S Rampini S, “Optical detection based on non-linear magnetophoretic transport of magnetic particle for particle and biological sensing and separation,” US patent 11,273,454; dated Mar 15, 2022
- Kilinc D**, S Rampini, R Schwamborn, W Kolch and GU Lee, “A microfluidic device for cell culture observation and manipulation,” WO/2015/032900; filed Sep, 5, 2014

#### Selected Oral Presentations

- Axonal and dendritic transport in the context of Alzheimer’s disease, MTTN 2023, Institut Curie – Orsay, France, Nov 16, 2023
- Low piconewton towing of CNS axons against diffusing and surface-bound repellents requires the inhibition of motor protein-associated pathways, 622. Heraeus Seminar: Neuronal Mechanics, Bad Honnef, Germany, Aug 17-19, 2016
- Microfluidic neuron culture devices to study neural development and disease, Nencki Institute of Experimental Biology, Warsaw, Poland, Apr 21, 2016
- Molecular targeting and localized mechanochemical stimulation of ErbB receptors with Fe-Au nanorods, BMES Annual Meeting, San Antonio, TX, Oct 22-25, 2014
- Parallel magnetic tweezers for pulling CNS axons towards a source of repellent factors, BMES Annual Meeting, Seattle, WA, Sep 25-28, 2013
- Morphological response of cultured chick forebrain neurons to mechanical injury, BMES Annual Meeting, Philadelphia, PA, Oct 13-16, 2004

#### Advanced Research Training

- ‘GdR ImaBio Practical Course: Molecular Dynamics Measurements in Cells’, Laboratoire PhLAM, Lille, France, Oct 8-11, 2019
- ‘EMBO Workshop: Molecular Neurobiology’, Crete, Greece, May 8-12, 2018
- ‘EMBO Practical Course: Microscopy, Modelling and Biophysical Methods’, EMBL Heidelberg, Germany, Sep 8-20, 2014
- ‘Computational methods for spatially realistic microphysiological simulations (MCELL) workshop’, Pittsburgh, PA, June 25-29, 2007
- ‘Eighth Annual Virtual Cell Short Course’, Farmington, CT, June 11-13, 2007
- ‘IEEE-EMBS/ASME Workshop on Nanoscale Modeling and Meas. of Mecha. Prop. of Cells and Proteins’, Philadelphia, PA, Sep 14-16, 2006
- ‘Virtual Institute Summer Session’, Greater Philadelphia Bioinformatics Alliance, Philadelphia, PA, Jun 26-Aug 11, 2006

#### Academic Service

- Peer reviewer for the following journals: *Sci Rep*, *BMC Neurosci*, *Biomaterials*, *ACS Chem Neurosci*, *Cell Mol Neurobiol*, *Neurosignals*, *Sensors*, *Front Cell Neurosci*, *Front Neurosci*, *Front Mol Neurosci*, *Int J Mol Sci*, *Transl Neurodegener*, *J Vis Exp*, *Rev Neuroscience*, *Cells*, *Handbook of Neuroengineering*, *Curr Protoc Cell Biol*, *Micromachines*, *Adv Healthc Mater*, *Pharmacol Rep*, *Biomedicine*, *Semin Cell Dev Biol*
- Abstract reviewer for *BMES Annual Meetings*
- Grant reviewer for the *Muenster University Medical School*, *Kazakhstan National Center of Science and Technology Evaluation*, *Agence Nationale de la Recherche*, *UKRI Future Leaders Fellowships*; *UKRI Medical Research Council*, *Latvian Council of Science*, *CaixaImpulse Innovation Grant*, *Alzheimer’s Association Research Grant*
- Monitor and proposal reviewer for the *FET Open* (Horizon 2020) and proposal reviewer for the *EIC Pathfinder* (Horizon Europe) programs

#### Teaching Experience

- Lecturer, “Introduction to cell mechanics and mechanotransduction,” Life Sciences & Technologies MS program, Univ. Lille, (2021–Present)
- Lecturer, LiCEND Summer School: “Experimental models for neurodegenerative diseases: from cells to model organisms,” Lille Center of Excellence for Neurodegenerative Diseases, Loos, France, July 2-5, 2019
- Co-organizer, “Quantifying synaptic plasticity in primary neurons using microfluidic culture devices and a custom image analysis workflow,” Functional Microscopy for Biology (MiFoBio) School, Seignosses, France, Oct 5-12, 2018
- Guest lecturer, optical and magnetic tweezers; ‘Nanomechanics’ course, UCD School of Physics (2010–2015)
- Teaching assistant, ‘Biomeasurements’ and ‘Biomechanics’ lab classes, Drexel University (2006–2007)

#### Mentoring Experience

Supervised or co-supervised 7 interns, 2 4<sup>th</sup> year students, 8 MS and 4 PhD students, 5 technicians/engineers and 5 postdoctoral fellows.