

# Jack P. K. Bravo, Ph.D.

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## Research experience

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|---------------------|---|
| Feb 2020 – Present  | Postdoctoral research scholar with Dr David Taylor<br>University of Texas at Austin, Texas, USA |
| Nov 2019 – Dec 2019 | Postdoctoral research scholar with Dr Alex Borodavka,<br>University of Cambridge, UK            |
| Oct 2015 – Oct 2019 | BBSRC-funded 4-year PhD with Dr Roman Tuma and Dr Alex<br>Borodavka, University of Leeds, UK    |
| Jul – Oct 2018      | Research internship with Dr. Chen Davidovich, Monash<br>University, Melbourne, Australia        |
| Sep – Dec 2014      | Undergraduate Honours Project with Dr. Roman Tuma,<br>University of Leeds, UK                   |
| July - Sep 2014     | Summer Research Project with Prof. Arwen Pearson,<br>University of Hamburg, Germany             |

## Education

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| 2015 – 2019 | University of Leeds, UK PhD in Biochemistry and Structural<br>Biophysics |
| 2012 – 2015 | University of Leeds, UK BSc (Hons) Biochemistry (2:1)                    |

## Talks & Presentations

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| September 2022 | <b>Oral Presentation</b> at Genome Engineering Seminar Series<br>(GESS) at Harvard Medical School (HMS) (online event)        |
| September 2022 | <b>Oral Presentation</b> at Toronto RNA Club, Toronto (online<br>event)   |
| June 2022      | <b>Poster Presentation</b> at Three Dimensional Electron<br>Microscopy Gordon Research Conference, Barcelona, Spain.          |
| June 2022      | <b>Oral Presentation</b> at CRISPR 2022 Meeting, Cambridge<br>Massachusetts, USA.   |
| Dec 2021       | <b>Oral Presentation</b> Early Career Research in Biological<br>Physics Symposium, UK (online event)                          |
| May 2021       | <b>Oral Presentation</b> for Department of Molecular Biosciences<br>Annual Retreat, University of Texas at Austin, Texas, USA |
| Mar 2021       | <b>Oral Presentation</b> for departmental DNA & RNA Club,<br>University of Texas at Austin, Texas, USA                        |
| Dec 2019       | <b>Oral Presentation</b> for RNA group at University of Cambridge,<br>Cambridge, UK   |
| July 2019      | <b>Oral Presentation</b> at Nucleic Acids Forum, London, UK   |
| July 2019      | <b>Poster Presentation</b> at Microscience Microscopy Congress,<br>Manchester, UK   |
| June 2019      | <b>Oral Presentation</b> at RNA Society Meeting, Krakow, Poland   |

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| Dec 2018   | <b>Oral Presentation</b> at MakroKomplex symposium on Structure and dynamics of large macromolecular complexes, University of South Bohemia, Czechia |
| May 2018   | <b>Poster Presentation</b> at Virus Assembly Symposium, Madeira, Portugal  |
| April 2018 | <b>Oral Presentation</b> at Microbiology Society Conference, Birmingham, UK  |
| Dec 2017   | <b>Poster Presentation</b> at BBSRC White Rose DTP symposium, University of York, UK   |
| July 2017  | <b>Poster Presentation</b> at Nucleic Acids Forum, London, UK  |
| June 2017  | <b>Poster Presentation</b> at RNA Society Meeting, Prague, Czechia   |
| April 2017 | <b>Oral Presentation</b> at Microbiology Society Conference, Edinburgh, UK   |
| Sep 2016   | <b>Oral Presentation</b> at CCP4 Northern Protein Structure Workshop, Carlisle, UK   |
| May 2016   | <b>Poster Presentation</b> at RNA Society Meeting, Kyoto, Japan  |
| Sep 2014   | <b>Poster Presentation</b> at International Conference for Crystallisation of Biological Macromolecules (ICCBM), Hamburg, Germany                    |
| Aug 2014   | <b>Oral Presentation</b> as part of a group of early-stage researchers at COST Action CM1306 Kick-off Meeting in Budapest, Hungary                   |

### Awards

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| 2021 | Prize for best talk, Molecular Biosciences Annual Retreat |
| 2021 | Prize for best talk, RNA & DNA club best presentation     |

### Teaching, Outreach & Service

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| 2022 - present | University of Texas at Austin, Department of Molecular Biosciences Diversity, Equality and Inclusion committee member               |
| 2022 - present | University of Texas at Austin, Department of Molecular Biosciences Postdoc Association committee member                             |
| 2022           | University of Texas at Austin, Youth Science Workshop   |
| 2021           | Guest lecture within "Physical Methods of Biochemistry" undergraduate course, UT Austin.  |
| 2021           | Led sub-group discussion on CRISPR complexes within "Structure and Function of Molecular Machines" undergraduate course, UT Austin. |

### Publications

1. **Bravo, J. P. K.**, et al. (2022) RNA targeting unleashes indiscriminate nuclease activity of CRISPR-Cas12a2. *Nature*. 10.1038/s41586-022-05560-w
2. Yelland, J. N. **Bravo, J. P. K.**, et al. (2022). A single 2'-O-methylation of ribosomal RNA gates assembly of a functional ribosome. *Nature Structural and Molecular Biology*. 10.1038/s41594-022-00891-8

3. **Bravo, J. P. K.**†, et al. (2022). Constructing the next-generation of CRISPR-Cas tools from structural blueprints. *Current Opinion in Biotechnology*. 10.1016/j.copbio.2022.102839. †Corresponding author.
4. Schwartz, E. A., **Bravo, J. P. K.**, et al. (2022) Assembly of multi-subunit fusion proteins into the RNA-targeting type III-D CRISPR-Cas effector complex. *bioRxiv*. 10.1101/2022.06.13.496011
5. O'Brien, R. E., **Bravo, J. P. K.**, et al. (2022) Modes of inhibition used by phage anti-CRISPRs to evade type I-C Cascade. *bioRxiv*. 10.1101/2022.06.15.496202. *Revised manuscript in preparation at Molecular Cell*.
6. **Bravo, J. P. K.**, et al. (2022). Structural basis for anti-phage immunity by DISARM. *bioRxiv. Nature Comms*. 10.1038/s41467-022-30673-1
7. Schwartz, E. A.\*, McBride, T. M.\*., **Bravo, J. P. K.**\*, et al. (2022). Structural basis for PAM-dependent recognition of nucleic acids by type I-D Cascade. *Nature Comms*. 10.1038/s41467-022-30402-8. \*Co-first author.
8. **Bravo, J. P. K.**, et al. (2022). Structural mechanisms of mismatch surveillance by CRISPR-Cas9. *Nature*. 10.1038/s41586-022-04470-1
9. **Bravo, J.P.K.**, et al. (2021). Structural basis of rotavirus RNA chaperone displacement and RNA annealing. *PNAS*. 10.1073/pnas.2100198118
10. Geiger, F., Papa, G., Arter, W.E., Acker, J., Saar, K.L., Qi, R., **Bravo, J.P.K.**, et al. (2021). Rotavirus Replication Factories Are Complex Ribonucleoprotein Condensates. *EMBO J*. 10.15252/embj.2021107711
11. Steens, J.A., Zhu, Y., Taylor, D.W., **Bravo, J.P.K.**, et al. (2021) SCOPE: Flexible targeting and stringent CARF activation enables type III CRISPR-Cas diagnostics. *Nature Comms*. 10.1038/s41467-021-25337-5
12. Zhou, Y.\*., **Bravo, J.P.K.**\*, Taylor, H.N.\*., et al. (2021). Structure of a type IV CRISPR-Cas effector complex. *iScience*. \*Co-first author. 10.1016/j.isci.2021.102201
13. **Bravo, J.P.K.**, et al. (2021). Remdesivir is a delayed translocation inhibitor of SARS CoV-2 replication in vitro. *Molecular Cell*. 10.1016/j.molcel.2021.01.035
14. O'Brien, R.E., Santos, I. C., Wrapp, D., **Bravo, J. P. K.**, et al. (2020). Structural basis for assembly of non-canonical small subunits into type I-C Cascade. *Nature Comms*. 10.1038/s41467-020-19785-8.
15. **Bravo, J. P. K.**, et al. (2018) Stability of local secondary structure determines selectivity of viral RNA chaperones. *Nucleic Acids Res*., 10.1101/293191.

## Patents

COMPOSITIONS AND METHODS RELATED TO MODIFIED CAS12A2 MOLECULES. 63/349,225

COMPOSITIONS AND METHODS FOR CAS9 MOLECULES WITH IMPROVED GENE EDITING PROPERTIES. 63/330,593

METHODS AND COMPOSITIONS FOR IMPROVED CAS9 SPECIFICITY. 63/243,481