Dr. Maxim V. Kapralov

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Research interests: Translational photosynthesis • Global food security • Genetic engineering.

Education and research career

09/2017 – present	Senior Lecturer, Newcastle University, UK.
05/2015 – 08/2017	Lecturer, Liverpool John Moores University, UK.
06/2013 – 04/2015	RIPE Research Fellow, Australian National University, Australia.
09/2007 – 04/2013	BBSRC/NERC Postdoctoral Researcher, University of Oxford, UK.
06/2005 – 08/2007	BBSRC Postdoctoral Researcher, University of Birmingham, UK.
12/2004 – 02/2005	CRDF funded Visiting Researcher, Washington State University, USA.
09/2000 – 11/2004	PhD, Institute of Plant & Animal Ecology, Russian Academy of Sciences.
09/1998 – 06/2000	MSc in Biology, Ural Federal University, Ekaterinburg, Russia.
09/1994 – 06/1998	BSc in Biology, Ural Federal University, Ekaterinburg, Russia.

Research grants and subcontracts

- 2018-19 **PI** N8 Research Partnership pump-priming award 'A competitive platform for production of complex recombinant proteins in microalgae tested by heterologous Rubisco assembly'; Co-I Luke Mackinder (York); £10,000.
- 2017-18 **PI** Newcastle University; Royal Society equipment research grant 'Restarting photosynthesis in resurrection plants'; £14,990.
- 2016-17 **Subcontractor** Liverpool John Moores University; Research service subcontract as a part of the RIPE project (http://ripe.illinois.edu) funded by the Gates foundation; PI Whitney (Australian National University); £60,000.
- 2016-17 **PI** LJMU; Finnis Scott Foundation research grant 'Evolution of extreme environmental tolerance in the plant family Linderniaceae'; Co-PI Grant-Downton (Oxford); £14,200.
- 2010-13 **Co-author/named researcher** NERC research grant 'Rubisco evolution, photosynthesis and plant adaptation to climate change' NE/H007741/1; PIs Filatov & Smith (Oxford); £429,597.

Awards for research exchange visits one to six months long: **2016** SANBI, South Africa. **2015** Zurich University of Applied Sciences. Host: Dr. Anisimova. **2012 & 2010** University of Balearic Islands, Spain. Host: Dr. Galmés. **2004** Washington State University, USA. Hosts: Profs. Edwards & Roalson. **2003** National Centre for Biosystematics, U. Oslo, Norway. Host: Prof. Brochmann.

Invited presentations (last six years): 2017: York and Northumbria Universities (UK); **2016:** Cardiff University (UK), La Laguna University (Spain); **2015** Annual meeting Soc. for Molecular Biology & Evolution (Vienna, Austria), Realizing Increased Photosynthetic Efficiency for sustainable increases in crop yield (RIPE) annual meeting (Urbana-Champaign, USA), Molecular & Genome Evolution symposium, Manchester University (UK), University of Liverpool (UK); **2014**: Nanyang Technological University (Singapore); RIPE annual meeting (Boston, USA), Conference: Bioinformatics of Genome Regulation, Institute of Cytology & Genetics (Novosibirsk, Russia), Gordon Research Conference CO_2 Assimilation in Plants (Waterville Valley, USA); **2013** Conference of Australian Soc. for Biochemistry & Molecular Biology (Perth, Australia), XVI International Congress on Photosynthesis (St. Louis, USA), Zurich Technical University (Switzerland), Natural History Museum (UK).

Peer reviewer. *Grants*: The Israel Science Foundation. ***Journals*:** *Am. J. Botany*, *Ann. Bot., Biol. J. Linn. Soc., BMC Evol. Biol., Evolution, Frontiers Plant Phys., Heredity, J. Ex. Bot., Mol. Biol. Evol., Mol. Ecol., New Phytologist, Plant J., Plant Phys., Plant Science, PLoS ONE, PNAS.*

Peer reviewed publications

1. Hermida-Carrera C, Fares MA, Fernández Á, Gil-Pelegrín E, **Kapralov MV**, Mir A, Molins A, Peguero-Pina J, Rocha J, Sancho-Knapik D & Galmés J (2017) Positively selected amino acid replacements within the RuBisCO enzyme of oak trees are associated with ecological adaptations. *PLoS One*. 12:8.
2. Sharwood RE, Ghannoum O, **Kapralov MV**, Gunn LH, Whitney SM (2016) Temperature responses of Rubisco from Paniceae grasses provide opportunities for improving C_3 photosynthesis. *Nature Plants.* 2:16186. **Featured in editorial** by RF Sage 'Photosynthesis: Mining grasses for a better Rubisco'.
3. Orr D, Alcântara A, **Kapralov MV**, Andralojc J, Carmo-Silva E, Parry MAJ (2016). Surveying Rubisco diversity and temperature response to improve crop photosynthetic efficiency. *Plant Phys.* 172:707-17. **Included in the Top Topics from 2016** http://blog.aspb.org/2016/12/13/best-of-2016-top-topics-in-plant-physiology-jounal/
4. Hermida-Carrera C, **Kapralov MV**, Galmés J (2016). Rubisco catalytic properties and temperature response in crops. *Plant Phys.* 171:2549-61.
5. Whitney SM, Birch R, Kelso C, Beck JL, **Kapralov MV** (2015). Improving recombinant Rubisco biogenesis, plant photosynthesis and growth by coexpressing its ancillary RAF1 chaperone. *Proc. Natl. Acad. Sci. U.S.A.* 112:3564-69.
6. Rosnow JJ, Evans MA, **Kapralov MV**, Cousins AB, Edwards GE, Roalson EH (2015). Kranz and single-cell forms of C_4 plants in the subfamily Suaedoideae show kinetic C_4 convergence for PEPC and Rubisco with divergent amino acid substitutions. *J. Exp. Bot.* 66:7347-58.
7. Galmés J, **Kapralov MV**, Copolovici LO, Hermida C, Niinemets Ü (2015). Temperature responses of the Rubisco maximum carboxylase activity across domains of life: phylogenetic signals, trade-offs, and importance for carbon gain. *Photosynthesis research* 123:183-201.
8. Galmés J, **Kapralov MV**, Andralojc PJ, Conesa MÀ, Keys AJ, Parry MAJ, Flexas J (2014) Expanding knowledge of the Rubisco kinetics variability in plant species: environmental and evolutionary trends. *Plant, Cell & Environment* 37:1989-2001. **Featured in editorial** by RE Sharwood & SM Whitney 'Correlating Rubisco catalytic and sequence diversity within C_3 plants with changes in atmospheric CO_2 concentrations'.
9. Grant-Downton RT, Terhem RB, **Kapralov MV**, Mehdi S, Rodriguez-Enriquez MJ, Gurr SJ, van Kan JAL, Dewey FM (2014) A novel *Botrytis* species is associated with a newly emergent foliar disease in cultivated *Hemerocallis*. *PLoS ONE* 9(6): e89272.
10. Galmés J, Andralojc PJ, **Kapralov MV**, Flexas J, Keys AJ, Molins A, Parry MAJ, Conesa MÀ (2014) Environmentally driven evolution of Rubisco and improved photosynthesis and growth within the C_3 genus *Limonium* (Plumbaginaceae). *New Phytologist* 203:989-99.
11. **Kapralov MV,** Votintseva AA, Filatov DA (2013) Molecular adaptation during a rapid adaptive radiation. *Mol. Biol. Evol.* 30(5):1051-59.
12. **Kapralov MV**, Smith JAC, Filatov DA (2012) Rubisco evolution in C_4 eudicots: an analysis of Amaranthaceae *sensu lato. PLoS ONE* 7(12): e52974.
13. Young JN, Rickaby REM, **Kapralov MV**, Filatov DA (2012) Adaptive signals in algal Rubisco reveal a history of ancient atmospheric CO_2. *Philos. Trans. R. Soc. B: Biol. Sci.* 367:483-92.
14. **Kapralov MV**, Kubien DS, Andersson I, Filatov DA (2011) Changes in Rubisco kinetics during the evolution of C_4 photosynthesis in *Flaveria* (Asteraceae) are associated with positive selection on genes encoding the enzyme. *Mol. Biol. Evol.* 28:1491-503.

15. Wang M, **Kapralov MV**, Anisimova M (2011) Coevolution of amino acid residues in the key photosynthetic enzyme Rubisco. *BMC Evolutionary Biology* 11:266.
16. **Kapralov MV**, Filatov DA (2011) Does large genome size limit speciation in endemic island floras? *J. Bot.* Article ID 458684. doi:10.1155/2011/458684.
17. Dixon CJ, **Kapralov MV**, Filatov DA (2011) Gene flow and species cohesion following the spread of *Schiedea globosa* (Caryophyllaceae) across the Hawaiian Islands. *J. Evol. Biol.* 24:1-11.
18. Gossmann TI, Song B-H, Windsor AJ, Mitchell-Olds T, Dixon CJ, **Kapralov MV**, Filatov DA, Eyre-Walker A (2010) Genome wide analyses reveal little evidence for adaptive evolution in many plant species. *Mol. Biol. Evol.* 27:1822-32.
19. **Kapralov MV**, Stift M, Filatov DA (2009) Evolution of genome size in Hawaiian endemic genus *Schiedea* (Caryophyllaceae). *Tropical Plant Biology* 2:77-83.
20. **Kapralov MV**, Filatov DA (2007) Widespread positive selection in the photosynthetic Rubisco enzyme. *BMC Evol. Biol.* 7:73.
21. **Kapralov MV**, Filatov DA (2006) Molecular adaptation during adaptive radiation in the Hawaiian endemic genus *Schiedea*. *PLoS ONE* 1:e8.
22. **Kapralov MV**, Akhani H, Voznesenskaya EV, Edwards G, Franceschi V, Roalson EH (2006) Phylogenetic relationships in the Salicornioideae/Suaedoideae/Salsoloideae *s.l*. (Chenopodiaceae) clade and a clarification of the phylogenetic position of *Bienertia* and *Alexandra* using multiple DNA sequence datasets. *Syst. Bot.* 31:571-85.
23. **Kapralov MV**, Gabrielsen TM, Sarapultsev IE, Brochmann C (2006) Genetic enrichment of the arctic clonal plant *Saxifraga cernua* at its southern periphery via the alpine sexual *Saxifraga sibirica. Mol. Ecol.* 15:3401-11.
24. **Kapralov MV** (2004) Genotypic variation in populations of the clonal plant *Saxifraga cernua* in the central and peripheral regions of the species range. *Rus. J. Ecol.* 35:413-6.