



SFI-funded Q-Exactive Mass Spectrometry Facility: 12/RI/2346(3)

Maynooth University; (June 2014 – 6 September 2023)

129 Peer-Reviewed Publications by Multiple Principal Investigators.

Context:

Following an application to Science Foundation Ireland which was conceptualised, promoted and led by Professor Sean Doyle, Maynooth University successfully competed for funding (€566,540; 12/RI/2346(3)) from Science Foundation Ireland to enable the purchase and installation of a quantitative mass spectrometer in 2012, including a two-year service contract. After a complex tendering process, managed by Doyle, a ThermoFisherScientific Q-Exactive Mass Spectrometer and allied Dionex nano LC system was purchased and fully installed in Autumn 2013. This facility not only enables the high sensitivity detection of metabolites and proteins in any biological specimen, but has also allowed comparative label-free quantitative proteomic analysis to be undertaken, whereby the relative abundance of identical proteins in different biological specimens can be elucidated.

Since 2013, the facility has been expertly operated and maintained by Ms Caroline Batchelor BSc with support from various academic staff members, especially Drs R. Owens, J. Carolan and P. Dowling. The facility has been used by many members of staff from the Departments of Biology & Chemistry (primarily Bayram, Carolan, Dowling, Doyle, Fitzpatrick, Griffin, Jones, Kavanagh, Ohlendieck, Owens and Stephens (and others)), plus internal, national and international collaborators. Significantly, the quantitative mass spectrometry facility has enabled and supported the work of so many PhD students and Post-Doctoral Fellows in the Department of Biology which has greatly assisted in the preparation of high-quality PhD theses, research publications in high-impact international journals and competitive grant applications from multiple NUIM Investigators. The facility is operated on an access charge model ($n = 2$ since 2012) which supports the ongoing upkeep of the instrumentation, and provides funding for annual service contracts. Multiple industry partners, both SMEs & MNCs, Semi-States and HEIs (Alltech, Airmid Healthgroup Limited, Leo Pharma A/S, Deerland Probiotics & Enzymes, Nuritas, Accuplex Diagnostics, Enfer Scientific, Teagasc, UCD, DCU, TCD, ITT Dublin and NUIG), have also accessed the facility at commercial rates, and many joint funding initiatives have resulted from these interactions.

The mass spectrometry facility has underpinned much high-quality research, grant applications and enabled new collaborations, within and external to the Department of Biology. The enclosed publications (***n = 129; equates to over one per month since commissioning***) clearly elaborate both the breadth of applications, and depth of analyses, which are possible using quantitative proteomic and metabolomic investigations.

2014 (n = 2)

1. Dolan, S.K., **Owens, R.A.**, O'Keeffe, G., Hammel, S., **Fitzpatrick, D.A.**, Jones G.W. and **Doyle, S.** (2014) Regulation of Non-ribosomal Peptide Synthesis: Bis-thiomethylation Attenuates Gliotoxin Biosynthesis in *Aspergillus fumigatus*. *Chemistry & Biology*. 21(8):999–1012. doi: 10.1016/j.chembiol.2014.07.006

O' Keffe G., Hammel, S., Owens, R.A., Keane, T.M., **Fitzpatrick D.A.**, Jones G.W. and **Doyle S.** (2014) RNAseq Reveals the Pan-Transcriptomic Impact of Attenuating the Gliotoxin Self-Protection Mechanism in *Aspergillus fumigatus*. *BMC Genomics*. 15:894. doi: 10.1186/1471-2164-15-894

2015 (n = 6)

Murphy S, Henry M, Meleady P, Zweyer M, Mundegar RR, Swandulla D, **Ohlendieck K.** (2015) Simultaneous Pathoproteomic Evaluation of the Dystrophin-Glycoprotein Complex and Secondary Changes in the mdx-4cv Mouse Model of Duchenne Muscular Dystrophy. *Biology (Basel)*. 4(2):397-423. doi: 10.3390/biology4020397

Murphy S, Zweyer M, Mundegar RR, Henry M, Meleady P, Swandulla D, **Ohlendieck K.** (2015) Concurrent Label-Free Mass Spectrometric Analysis of Dystrophin Isoform Dp427 and the Myofibrosis Marker Collagen in Crude Extracts from mdx-4cv Skeletal Muscles. *Proteomes*. 3(3):298-327. doi:10.3390/proteomes3030298

5. Fagan, S., Murphy, R., Connolly, C., Ward, P., **Owens, R.A.** and **Doyle S.** (2015) Biochemical comparison of commercial Selenium yeast preparations. *Biological Trace Element Research*. 166(2):245-259. doi: 10.1007/s12011-015-0242-6

Delgado, J., **Owens, R.A.**, **Doyle, S.**, Asensio, M.A. and Núñez, F. (2015) Impact of the antifungal protein PgAFP from *Pencillium chrysogenum* on the protein profile in *A. flavus* and assessment of the derived detrimental effects. *Applied Microbiology and Biotechnology*. 99(20):8701-8715. doi: 10.1007/s00253-015-6731-x

Owens R.A., O'Keeffe G., Smith, E.B., Dolan, S.K., Hammel S., Sheridan K.J., **Fitzpatrick, D.A.**, Keane, T.M., Jones G.W. and **Doyle S.** (2015) Interplay between gliotoxin resistance, secretion and the methyl/methionine cycle in *Aspergillus fumigatus*. *Eukaryotic Cell*. 14(9):941-957. doi: 10.1128/EC.00055-15.

Browne N., Surlis C., Maher A., Gallagher C., **Carolan J.C.**, Clynes M., **Kavanagh K.** (2015) Prolonged pre-incubation increases the susceptibility of *Galleria mellonella* larvae to bacterial and fungal infection. *Virulence*. 6(5):458-465. doi: 10.1080/21505594.2015.1021540

2016 (n = 7)

Surlis., C., **Carolan J.C.**, Coffey M.F. and **Kavanagh K.** (2016) Proteomic analysis of Bayvarol® resistance mechanisms in the honey bee parasite *Varroa destructor*. Journal of Apicultural Research. 55(1):49-64. doi: [10.1080/00218839.2016.1196015](https://doi.org/10.1080/00218839.2016.1196015)

10. Manzanares-Miralles L., Sarikaya-Bayram, Ö., Smith E.B., Dolan S.K., **Bayram, Ö.**, Jones G.W. and **Doyle S.** (2016) Quantitative proteomics reveals the mechanism and consequence of gliotoxin-mediated dysregulation of the methionine cycle in *Aspergillus niger*. Journal of Proteomics. 131:149-162. doi: [10.1016/j.jprot.2015.10.024](https://doi.org/10.1016/j.jprot.2015.10.024)

Murphy S., Dowling P., Zwyer M., Mundegar R.R., Henry M., Meleady P., Swandulla D. and **Ohlendieck K.** (2016) Proteomic analysis of dystrophin deficiency and associated changes in the aged mdx-4cv heart model of dystrophinopathy-related cardiomyopathy. Journal of Proteomics. 145:24-36. doi: [10.1016/j.jprot.2016.03.011](https://doi.org/10.1016/j.jprot.2016.03.011)

Delgado, J., **Owens, R.A.**, **Doyle, S.**, Asensio, M.A. and Núñez, F. (2016) Increased chitin biosynthesis contributes to the resistance of *Penicillium polonicum* against the antifungal protein PgAFP. Applied Microbiology and Biotechnology. 100(1):371-83. doi: [10.1007/s00253-015-7020-4](https://doi.org/10.1007/s00253-015-7020-4)

Sheridan K.J., Lechner B.E., O'Keeffe G., Keller M.A., Werner E.R., Lindner H., **Jones G. W.**, Haas H. and **Doyle S.** (2016). Ergothioneine Biosynthesis and Functionality in the Opportunistic Fungal Pathogen, *Aspergillus fumigatus*. Scientific Reports. 6:35306. doi: [10.1038/srep35306](https://doi.org/10.1038/srep35306)

Alves de Castro P., Fernanda dos Reis, T., Dolan S.K., Oliveira Manfiolli A., Brown N.A., Jones, G.W., **Doyle S.**, Riaño Pachón D.M., Márcio Squina F., Caldana C., Singh A., Del Poeta M., Hagiwara D. and Goldman G.H. (2016) The *Aspergillus fumigatus* SchASCH9 kinase modulates SakAHOG1 MAP kinase activity and it is essential for virulence. Molecular Microbiology. 102(4):642-671. doi: [10.1111/mmi.13484](https://doi.org/10.1111/mmi.13484)

15. Deslyper G, Colgan TJ, Cooper AJ, Holland CV, **Carolan JC.** (2016) A Proteomic Investigation of Hepatic Resistance to Ascaris in a Murine Model. PLoS Neglected Tropical Diseases. 10(8):e0004837. doi: [10.1371/journal.pntd.0004837](https://doi.org/10.1371/journal.pntd.0004837)

2017 (n = 18)

Dolan S.K, Bock, T., Hering, V., **Owens, R.A.**, Jones, G.W., Blankenfeldt W., **Doyle S.** (2017) Structural, mechanistic and functional insight into gliotoxin bis-thiomethylation in *Aspergillus fumigatus*. Open Biology. 7:160292. doi: [10.1098/rsob.160292](https://doi.org/10.1098/rsob.160292)

Hommier A, O'Brien ME, Lynch V, Clynes M, Morgan R, **Dowling P.** (2017) Proteomic analysis of bronchoalveolar lavage fluid (BALF) from lung cancer patients using label-free mass spectrometry. BBA Clin. 7:97-104. doi: [10.1016/j.bbaci.2017.03.001](https://doi.org/10.1016/j.bbaci.2017.03.001).

Maguire R, Kunc M, Hyrsil P, **Kavanagh K.** (2017) Analysis of the acute response of *Galleria mellonella* larvae to potassium nitrate. Comp Biochem Physiol C Toxicol Pharmacol. 195:44-51. doi: [10.1016/j.cbpc.2017.02.007](https://doi.org/10.1016/j.cbpc.2017.02.007).

Mulvihill ED, Moloney NM, Owens RA, Dolan SK, Russell L, **Doyle S.** (2017) Functional Investigation of Iron-Responsive Microsomal Proteins, including MirC, in *Aspergillus fumigatus*. Front Microbiol. 8:418. doi: [10.3389/fmicb.2017.00418](https://doi.org/10.3389/fmicb.2017.00418).

20. Delgado, J., **Owens, R.A., Doyle, S.,** Nunez, F., Asensio M.A. (2017) Quantitative proteomics reveals new insights into calcium-mediated resistance mechanisms in *Aspergillus flavus* against the antifungal protein PgAFP in cheese. *Food Microbiol.* 66: 1-10.

Murphy S, **Dowling P**, Zweyer M, Henry M, Meleady P, Mundegar RR, Swandulla D, **Ohlendieck K.** (2017) Proteomic profiling of mdx-4cv serum reveals highly elevated levels of the inflammation-induced plasma marker haptoglobin in muscular dystrophy. *Int J Mol Med.* doi: 10.3892/ijmm.2017.2952.

McNamara L, **Carolan J.C., Griffin C.T., Fitzpatrick D., Kavanagh K.** (2017) The effect of entomopathogenic fungal culture filtrate on the immune response of the greater wax moth, *Galleria mellonella*. *J Insect Physiol.* 2017 May 22. pii: S0022-1910(17)30073-2. doi: 10.1016/j.jinsphys.2017.05.009.

Valsecchi I, Sarikaya Bayram Ö, Wong Sak Hoi J, Muszkieta L, Gibbons J, Prevost MC, Mallet A, Krijnse-Locker J, Ibrahim-Granet O, Mouyna I, Carr P, Bromley M, Aimanianda V, Yu YJ, Rokas A, Braus G, Saveanu C, **Bayram Ö**, Latgé J-P. (2017) MybA, a transcription factor involved in conidiation and conidial viability of the human pathogen *Aspergillus fumigatus*. *Mol Microbiol.* doi: 10.1111/mmi.13744.

Murphy, S., **Ohlendieck, K.** (2017) Mass spectrometric identification of dystrophin, the protein product of the Duchenne muscular dystrophy gene, in distinct muscle surface membranes. *International Journal of Molecular Medicine* 0, no. 0 (1899): 0-0. <https://doi.org/10.3892/ijmm.2017.3082>.

25. Manfiolli AO, de Castro PA, Dos Reis TF, Dolan S, **Doyle S**, Jones G, Riaño Pachón DM, Ulaş M, Noble LM, Mattern DJ, Brakhage AA, Valiante V, Silva-Rocha R, **Bayram O**, Goldman GH. (2017) *Aspergillus fumigatus* protein phosphatase PpzA is involved in iron assimilation, secondary metabolite production, and virulence. *Cell Microbiol.* 2017 Jul 28. doi: 10.1111/cmi.12770.

Murphy S., Brinkmeier H., Krautwald M., Henry M., Meleady P. and **Ohlendieck K.** (2017) Proteomic profiling of the dystrophin complex and membrane fraction from dystrophic mdx muscle reveals decreases in the cytolinker desmoglein and increases in the extracellular matrix stabilizers biglycan and fibronectin. *J Muscle Res Cell Motil.* doi: 10.1007/s10974-017-9478-4.

Sheehan G, **Kavanagh K.** (2017) Analysis of the early cellular and humoral responses of *Galleria mellonella* larvae to infection by *Candida albicans*. Virulence. doi: 10.1080/21505594.2017.1370174.

Collins C., Hurley R., Almutlaqah N., O'Keeffe G., Keane T.M., **Fitzpatrick D.A.** and **Owens R.A.** (2017) Proteomic characterization of *Armillaria mellea* reveals oxidative stress response mechanisms and altered secondary metabolism profiles. *Microorganisms.* 5(3). pii:E60. doi: 10.3390/microorganisms5030060

Sipos G., Prasanna A.N., Walter M.C., O'Connor E., Balint B., Krizsan K., Kiss B., Hess J., Varga T., Slot J., Riley R., Boka B., Rigling D., Barry K., Lee J., Mihaltcheva S., LaButti K., Lipzen A., Waldron R., Moloney N.M, Sperisen C., Kredics L., Vagvolgyi C., Patrignani A., **Fitzpatrick D.**, Nagy I., **Doyle S.**, Anderson J., Grigoriev I.V., Güldener U., Münsterkötter M. and Nagy L.G. (2017) Genome expansion and lineage-specific genetic innovations in the

forest pathogenic fungi *Armillaria*. *Nature Ecology & Evolution*. 1(12):1931-1941. doi: 10.1038/s41559-017-0347-8

30. Kavanagh E.L., Lindsay S., Halasz M., Gubbins L.C., Weiner-Gorzel K., Guang M.H.Z., McGoldrick A., Collins E., Henry M., Blanco-Fernández A., Gorman PO., Fitzpatrick P., Higgins M.J., **Dowling P.**, McCann A. (2017) Protein and chemotherapy profiling of extracellular vesicles harvested from therapeutic induced senescent triple negative breast cancer cells. *Oncogenesis*. 6(10):e388. doi: 10.1038/oncsis.2017.82.

Maguire R., Kunc M., Hyrsi P., **Kavanagh K.** (2017) Caffeine administration alters the behaviour and development of *Galleria mellonella* larvae. *Neurotoxicol Teratol*. pii: S0892-0362(17)30146-0. doi: 10.1016/j.ntt.2017.10.002. [Epub ahead of print].

Murphy S. and **Ohlendieck K.** (2017) Proteomic profiling of large myofibrillar proteins from dried and long-term stored polyacrylamide gels. *Anal Biochem*. pii: S0003-2697(17)30488-8. doi: 10.1016/j.ab.2017.11.022. [Epub ahead of print]

Surlis., C., Carolan J.C., Coffey M.F. and **Kavanagh K.** (2017) Quantitative proteomics reveals divergent responses in *Apis mellifera* worker and drone pupae to parasitization by *Varroa destructor*. *J. Insect Physiol.* Online 19 December 2017. <https://doi.org/10.1016/j.jinsphys.2017.12.004>

2018 (n = 17)

Doyle S., Jones G.W and Dolan S.K. (2018) Dysregulated Gliotoxin Biosynthesis Attenuates the Production of Unrelated Biosynthetic Gene Cluster-Encoded Metabolites in *Aspergillus fumigatus*. *Fungal Biology*. 122(4): 214-221.

35. Murphy S, Zweyer M, Henry M, Meleady P, Mundegar RR, Swandulla D, **Ohlendieck K.** (2018) Proteomic analysis of the sarcolemma-enriched fraction from dystrophic mdx-4cv skeletal muscle. *J Proteomics*. doi: 10.1016/j.jprot.2018.01.015. [Epub ahead of print].

Heavey S., **Dowling P.**, Moore G., Barr M.P., Kelly N., Maher S.G., Cuffe S., Finn S.P., O'Byrne K.J. and Gately K. (2018) Development and characterisation of a panel of phosphatidylinositide 3-kinase - mammalian target of rapamycin inhibitor resistant lung cancer cell lines. *Sci Rep.* 8(1):1652. doi: 10.1038/s41598-018-19688-1.

Maher A, Staunton K and **Kavanagh K.** (2018) Analysis of the effect of temperature on protein abundance in Demodex-associated *Bacillus oleronius*. *Pathog Dis.* doi: 10.1093/femspd/fty032. [Epub ahead of print].

Murphy S., Zweyer M., Mundegar R.R., Swandulla, D. and **Ohlendieck K.** (2018) Comparative gel-based proteomic analysis of chemically crosslinked complexes in dystrophic skeletal muscle. *Electrophoresis*. doi: 10.1002/elps.201800028. [Epub ahead of print]

Sheehan, G., Bergsson, G., McElvaney, N.G., Reeves, E.P. and **Kavanagh K.** (2018) The human cathelicidin antimicrobial peptide LL-37 promotes the growth of the pulmonary pathogen *Aspergillus fumigatus*. *Infect. Immun.* Online 30 April 2018. doi:10.1128/IAI.00097-18

40. Boulain H, Legeai F, Guy E, Morlière S, Douglas NE, Oh J, Murugan M, Smith M, Jaquiéry J, Peccoud J, White FF, **Carolan JC**, Simon JC, Sugio A. (2018) Fast Evolution and Lineage-

Specific Gene Family Expansions of Aphid Salivary Effectors Driven by Interactions with Host-Plants. *Genome Biol Evol.* In press. doi: 10.1093/gbe/evy097

Saleh, A.A., Jones, G.W., Tinley, F.C., Delaney, S.F., Alabbadi, S., Fenlon K., **Doyle, S.*** and **Owens, R.A.*** (2018) Systems Impact of Zinc Chelation by the Epipolythiodioxopiperazine Dithiol Gliotoxin in *Aspergillus fumigatus*: A New Direction in Natural Product Functionality. *Metalomics.* 10:854-866. doi: 10.1039/C8MT00052B * joint corresponding authors.

Murphy S, Zweyer M, Henry M, Meleady P, Mundegar RR, Swandulla D, **Ohlendieck K.** (2018) Subproteomic profiling of sarcolemma from dystrophic *mdx-4cv* skeletal muscle. *Data Brief.* 17:980-993. doi: 10.1016/j.dib.2018.02.020.

Rochford, G., Molphy, Z., Browne, N., Surlis, C., Devereux, M., McCann, M., Kellett, A., Howe, O. and **Kavanagh K.** (2018) In-vivo evaluation of the response of *Galleria mellonella* larvae to novel copper(II) phenanthroline-phenazine complexes. *J Inorg Biochem.* 186:135-146. doi: 10.1016/j.jinorgbio.2018.05.020.

de Assis, L.J., Ulas, M., Ries, L.N.A., El Ramli, N.A.M., Sarikaya-Bayram, O., Braus, G.H., **Bayram, O.**, Goldman, G.H. (2018) Regulation of *Aspergillus nidulans* CreA-Mediated Catabolite Repression by the F-Box Proteins Fbx23 and Fbx47. *MBio.* 9(3). pii: e00840-18. doi: 10.1128/mBio.00840-18.

45. Sheehan, G., Clarke, G. and **Kavanagh K.** (2018) Characterisation of the cellular and proteomic response of *Galleria mellonella* larvae to the development of invasive aspergillosis. *BMC Microbiol.* 18(1):63. doi: 10.1186/s12866-018-1208-6.

MacNamara LM, **Griffin CT, Fitzpatrick D, Kavanagh K, Carolan JC.** (2018) The effect of entomopathogenic fungal culture filtrate on the immune response and haemolymph proteome of the large pine weevil, *Hylobius abietis*. *Insect Biochem Mol Biol.* doi: 10.1016/j.ibmb.2018.07.001. [Epub ahead of print]

Frawley D., Karahoda B., Sarikaya-Bayram Ö & **Bayram Ö.** (2018) The HamE scaffold positively regulates MpkB phosphorylation to promote development and secondary metabolism in *Aspergillus nidulans*. *Scientific Reports.* 8, 16588.

Murphy S, Zweyer M, Mundegar RR, Swandulla D, **Ohlendieck K.** (2018) Dataset on the comparative proteomic profiling of mouse saliva and serum from wild type versus the dystrophic *mdx-4cv* mouse model of dystrophinopathy. *Data Brief.* 21:1236-1245. doi: 10.1016/j.dib.2018.10.082.

Green DS, Colgan TJ, Thompson RC, **Carolan JC.** (2018) Exposure to microplastics reduces attachment strength and alters the haemolymph proteome of blue mussels (*Mytilus edulis*). *Environ Pollut.* 246:423-434.

50. Murphy S, Zweyer M, Mundegar RR, Swandulla D, **Ohlendieck K.** (2018) Proteomic identification of elevated saliva kallikrein levels in the *mdx-4cv* mouse model of Duchenne muscular dystrophy. *Biochem Biophys Rep.* 18:100541. <https://doi.org/10.1016/j.bbrep.2018.05.006>

2019 (n = 14)

Sheehan, G. and **Kavanagh K.** (2019) Proteomic Analysis of the Responses of *Candida albicans* during Infection of *Galleria mellonella* Larvae. *J. Fungi* 5(1), 7; <https://doi.org/10.3390/jof5010007>

Morrin S.T., Owens R.A., LeBerre M., Gerlach J.Q., Joshi L., Bode L., Irwin J.A., and Hickey R.M. (2019) Interrogation of Milk-driven Changes to the Proteome of Intestinal Epithelial Cells by Integrated Proteomics and Glycomics. *J. Agric. Food Chem.* DOI: 10.1021/acs.jafc.8b06484

McNamara L., Dolan S.K., Walsh J.M.D., **Stephens J.C.**, Glare T.R., **Kavanagh K.** and **Griffin C.T.** (2019) Oosporein, an abundant metabolite in *Beauveria caledonica*, with a feedback induction mechanism and a role in insect virulence. *Fungal Biology*. In press. <https://doi.org/10.1016/j.funbio.2019.01.004>

Elramli N, Karahoda B, Sarikaya-Bayram Ö, Frawley D, Ulas M, Oakley CE, Oakley BR, Seiler S, **Bayram Ö.** (2019) Assembly of a heptameric STRIPAK complex is required for coordination of light-dependent multicellular fungal development with secondary metabolism in *Aspergillus nidulans*. *PLoS Genet.* 15(3):e1008053. doi: 10.1371/journal.pgen.1008053.

55. Waldron, R., McGowan, J., Gordon, N., McCarthy, C., Mitchell, E.B. and **Fitzpatrick, D.A.** (2019) *PLoS One*. Proteome and allergenome of the European house dust mite *Dermatophagoides pteronyssinus*. 14(5): e0216171. <https://doi.org/10.1371/journal.pone.0216171>

Sarikaya-Bayram, Ö., Dettmann, A., Karahoda, B., Moloney, N., Ormsby, T., McGowan, J., Cea-Sánchez, S., Miralles-Durán, A., Brancini, G., Luque, E., Fitzpatrick, D., Canovas, D., Corrochano, L., **Doyle, S.**, Selker, E., Seiler, S. and **Bayram, Ö.** (2019) Control of Development, Secondary Metabolism and Light-Dependent Carotenoid Biosynthesis by the Velvet Complex of *Neurospora crassa*. *Genetics*. 212(3):691-710.

Sheehan, G., Dixon, A., **Kavanagh, K.** (2019) Utilization of *Galleria mellonella* larvae to characterize the development of *Staphylococcus aureus* infection. *Microbiology*. doi: 10.1099/mic.0.000813. [Epub ahead of print]

Delgado, J., Núñez, F., Asensio, M. and **Owens R.A.** (2019) Quantitative proteomic profiling of ochratoxin A repression in *Penicillium nordicum* by protective cultures. *Int. J. Food Microbiol.* doi.org/10.1016/j.ijfoodmicro.2019.108243

Deslyper, G., Holland, C.V., Colgan T.J. & Carolan J.C (2019) The liver proteome in a mouse model for *Ascaris suum* resistance and susceptibility: evidence for an altered innate immune response. *Parasites & Vectors*, 12(1): 402. doi: 10.1186/s13071-019-3655-9

60. Ajdidi A, Sheehan G, Abu Elteen K, **Kavanagh K.** (2019) Assessment of the *in vitro* and *in vivo* activity of atorvastatin against *Candida albicans*. *J Med Microbiol.* doi: 10.1099/jmm.0.001065.

Waldron, R., McGowan J., Gordon, N., Mitchell E.B., **Fitzpatrick, D.A.** and **Doyle, S.** (2019) Characterisation of three Novel β-1,3 glucanases from the Medically Important House Dust Mite *Dermatophagoides pteronyssinus* (airmid). *Insect Biochemistry and Molecular Biology*. doi.org/10.1016/j.ibmb.2019.103242

Hartley, C.J., Lillis, P.E., **Owens, R.A.**, and **Griffin, C.T.** (2019) Infective juveniles of entomopathogenic nematodes (*Steinernema* and *Heterorhabditis*) secrete ascarosides and

respond to interspecific dispersal signals. J Invertebr Pathol. 107257. doi: 10.1016/j.jip.2019.107257.

Margalit, A., **Kavanagh, K.** and **Carolan J.C.** (2019) Characterization of the proteomic response of A549 cells following sequential exposure to *Aspergillus fumigatus* and *Pseudomonas aeruginosa*. J Proteome Research. <https://doi.org/10.1021/acs.jproteome.9b00520>

Eitle, M.W., **Carolan, J.C.**, Griesser, M. and Forneck A (2019) The salivary gland proteome of root-galling grape phylloxera (*Daktulosphaira vitifoliae* Fitch) feeding on *Vitis* spp. PLoS One. 14(12):e0225881. doi: 10.1371/journal.pone.0225881

2020 (n = 16)

65. Sheehan, G., Tully, L., and **Kavanagh K.A.** (2020) *Candida albicans* increases the pathogenicity of *Staphylococcus aureus* during polymicrobial infection of *Galleria mellonella* larvae. Microbiology. doi: 10.1099/mic.0.000892. [Epub ahead of print].

Frawley, D., Greco, C., Oakley, B., Alhussain, M.M., Fleming, A.B., Keller, N.P., **Bayram Ö.** (2020) The tetrameric pheromone module SteC-MkkB-MpkB-SteD regulates asexual sporulation, sclerotia formation and aflatoxin production in *Aspergillus flavus*. Cell Microbiol. doi: 10.1111/cmi.13192. [Epub ahead of print]

O'Connor, E., **Owens, R.**, **Doyle, S.**, Amini, A., Grogan, H. and **Fitzpatrick, D.A.** (2020) Proteomic investigation of interhyphal interactions between strains of *Agaricus bisporus*. Fungal Biology. 124(6):579-591. doi: 10.1016/j.funbio.2020.02.011.

Gargan, S., **Dowling, P.**, Zweyer, M., Swandulla, D. and **Ohlendieck K.** (2020) Identification of marker proteins of muscular dystrophy in the urine proteome from the mdx-4cv model of dystrophinopathy. Mol Omics. doi: 10.1039/c9mo00182d.

Ajididi, A., **Sheehan, G.** and **Kavanagh, K.** (2020) Exposure of *Aspergillus fumigatus* to Atorvastatin Leads to Altered Membrane Permeability and Induction of an Oxidative Stress Response. *J Fungi (Basel)*. 6(2). pii: E42. doi: 10.3390/jof6020042.

70. Sheehan, G., Konings, M., Lim, W., Fahal, A., **Kavanagh, K.** and van de Sande WWJ. (2020) Proteomic analysis of the processes leading to *Madurella mycetomatis* grain formation in *Galleria mellonella* larvae. PLoS Negl Trop Dis. 14(4):e0008190. doi: 10.1371/journal.pntd.0008190.

McGowan, J., O'Hanlon, R., **Owens, R.A.**, **Fitzpatrick, D.A.** (2020) Comparative Genomic and Proteomic Analyses of Three Widespread *Phytophthora* Species: *Phytophthora chlamydospora*, *Phytophthora gonapodyides* and *Phytophthora pseudosyringae*. Microorganisms. 8(5):E653. doi: 10.3390/microorganisms8050653.

Margalit, A., **Carolan, J.C.**, Sheehan, D., **Kavanagh, K.** (2020) The *Aspergillus fumigatus* secretome alters the proteome of *Pseudomonas aeruginosa* to stimulate bacterial growth: implications for co-infection. Mol Cell Proteomics. 19(8):1346-1359. doi: 10.1074/mcp.RA120.002059.

Frawley, D., Stroe, M.C., Oakley, B.R., Heinekamp, T., Straßburger, M., Fleming, A.B., Brakhage, A.A., **Bayram, Ö.** (2020) The Pheromone Module SteC-MkkB-MpkB-SteD-HamE Regulates Development, Stress Responses and Secondary Metabolism in *Aspergillus fumigatus*. Front Microbiol. 11:811. doi: 10.3389/fmicb.2020.00811.

García-Béjar, B., **Owens, R.A.**, Briones, A., Arévalo-Villena, M. (2020) Differential distribution and proteomic response of *Saccharomyces cerevisiae* and non-model yeast species to zinc. Environ Microbiol. doi: 10.1111/1462-2920.15206.

75. Kosanovic, D., Grogan, H., **Kavanagh, K.** (2020) Exposure of *Agaricus bisporus* to *Trichoderma aggressivum f. europaeum* leads to growth inhibition and induction of an oxidative stress response. Fungal Biol. 124(9):814-820. doi: 10.1016/j.funbio.2020.07.003.

Scott, J., Sueiro-Olivares, M., Thornton, B., **Owens, R.A.**, Muhamadali, H., Fortune-Grant, R., Thomson, D., Thomas, R., Hollywood, K., **Doyle, S.**, Goodacre, R., Tabernero, L., Bignell, E. and Amich, J. (2020) Targeting methionine synthase in a fungal pathogen causes a metabolic imbalance that impacts cell energetics, growth and virulence. mBio 01985-20R1. Accepted. 15 September 2020.

Silva L.P., Frawley D., Assis L.J., Tierney C., Fleming A.B., **Bayram O.**, Goldman G.H. (2020) Putative Membrane Receptors Contribute to Activation and Efficient Signaling of Mitogen-Activated Protein Kinase Cascades during Adaptation of *Aspergillus fumigatus* to Different Stressors and Carbon Sources. mSphere. 5(5):e00818-20. doi: 10.1128/mSphere.00818-20.

Tierney, C., Bazou, D., Lê, G., Dowling P. and O'Gorman P. (2020) Saliva-omics in plasma cell disorders- Proof of concept and potential as a non-invasive tool for monitoring disease burden. J Proteomics. 104015. doi: 10.1016/j.jprot.2020.104015.

Piatek M., Griffith, D.M. and Kavanagh K. (2020) Quantitative proteomic reveals gallium maltolate induces an iron-limited stress response and reduced quorum-sensing in *Pseudomonas aeruginosa*. J Biol Inorg Chem doi: 10.1007/s00775-020-01831-x.

80. Kavanagh E.L., Halasz, M., **Dowling P.**, Withers, J., Lindsay, S., Higgins, M.J., Irwin, J.A., Rudd, P.M., Saldova, R. and McCann A. (2020) N-Linked glycosylation profiles of therapeutic induced senescent (TIS) triple negative breast cancer cells (TNBC) and their extracellular vesicle (EV) progeny. Mol Omics. doi: 10.1039/d0mo00017e.

2021 (n = 17)

de Assis, L.J., Pereira Silva, L., **Bayram O., Dowling P.**, Kniemeyer O., Krüger T., Brakhage A.A., Chen, Y., Dong, L., Tan, K., Wong, K. H., Ries L.N.A., Goldman G.H. (2021) Carbon Catabolite Repression in Filamentous Fungi Is Regulated by Phosphorylation of the Transcription Factor CreA. mBio, 12 (1) e03146-20; DOI: 10.1128/mBio.03146-20

Sahu, N., Merényi, Z., Bálint, B., Kiss, B., Sipos, G., **Owens, R.A.**, Nagy, L.G. (2021) Hallmarks of Basidiomycete Soft- and White-Rot in Wood-Decay -Omics Data of Two *Armillaria* Species. Microorganisms. 9, 149: 1-20.

Asai, M., Sheehan, G., Li, Y., Robertson, B. D., **Kavanagh, K.**, Langford, P. R., & Newton, S. M. (2021). Innate Immune Responses of *Galleria mellonella* to *Mycobacterium bovis* BCG Challenge Identified Using Proteomic and Molecular Approaches. *Frontiers in Cellular and Infection Microbiology*, 11, 619981. <https://doi.org/10.3389/fcimb.2021.619981>

Sheehan, G., Margalit, A., Sheehan, D. and **Kavanagh, K.** (2021) Proteomic profiling of bacterial and fungal induced immune priming in *Galleria mellonella* larvae. J. Insect Physiol. <https://doi.org/10.1016/j.jinsphys.2021.104213>

85. Miettinen, J.J., Kumari, R., Traustadottir, G.A., Huppunen, M.E., Sergeev, P., Majumder, M.M., Schepsky, A., Gudjonsson, T., Lievonen, J., Bazou, D., **Dowling, P.**, O'Gorman, P., Slipicevic, A., Anttila, P., Silvennoinen, R., Nupponen, N.N., Lehmann, F., Heckman, C.A. (2021) Aminopeptidase Expression in Multiple Myeloma Associates with Disease Progression and Sensitivity to Melflufen. *Cancers (Basel)*. 13(7):1527. doi: 10.3390/cancers13071527.

Rawlings, A., O'Connor, E., Moody, S., Dudley, E., Boddy, L., Fowler, M., **Fitzpatrick D.A.**, **Doyle S.** and Eastwood, D.C. (2021) Metabolic responses of two pioneer wood decay fungi to diurnally cycling temperature. *J. Ecol.* JEcol-2020-0959. Submitted 21 September 2020. In revision. R1 resubmitted 31 March 2021. Accepted 16 April 2021.

O'Connor, E., **Doyle, S.**, Amini, A., Grogan, H and **Fitzpatrick, D.A.** (2021) Transmission of Mushroom Virus X and the impact of virus infection on the transcriptomes and proteomes of different strains of *Agaricus bisporus*. *Fungal Biology*. FUNBIO-D-20-00366.R1. Accepted 21 April 2021.

García-Béjar, B., **Owens, R.A.**, Briones, A., Arévalo-Villena, M. (2021) Proteomic profiling and glycomic analysis of the yeast cell wall in strains with Aflatoxin B₁ elimination ability. *Environ Microbiol*. doi: 10.1111/1462-2920.15606. Epub ahead of print. PMID: 34029450.

Verissimo, De M. C., O'Brien C. López Corrales J., Dorey A., Cwiklinski K., Lalor, R., Doyle J.M., Field S., Masterson C., Ribes Martinez, E., Hughes G., Bergin C., Walshe K., McNicholas B., Laffey J. G., Dalton J. P., Kerr C., and **Doyle S.** (2021) Improved diagnosis of SARS-CoV-2 by using nucleoprotein and Spike protein fragment 2 in quantitative dual ELISA tests. *Epidemiology & Infection*. 149:e140. <https://doi.org/10.1101/2021.04.07.21255024>

90. Tierney, C., Bazou, D., Majumder, M.M., Anttila, P., Silvennoinen, R., Heckman C.A., **Dowling, P.** and O'Gorman, P. (2021) Next generation proteomics with drug sensitivity screening identifies sub-clones informing therapeutic and drug development strategies for multiple myeloma patients. *Scientific Reports* 11:12866. <https://doi.org/10.1038/s41598-021-90149-y>

Traynor, A.M., **Owens, R.A.**, Coughlin, C.M., Holton, M.C., Jones, G.W., Calera, J.A. and **Doyle. S.** (2021) At the metal-metabolite interface in *Aspergillus fumigatus*: towards untangling the intersecting roles of zinc and gliotoxin. *Microbiology (Special edition: Metals in Microbiology)*. Accepted 1 September 2021.

Liu, M., Wang, Y., Miettinen, J.J., Kumari, R., Majumder, M.M., Tierney, C., Bazou, D., Parsons, A., Suvela, M., Lievonen, J., Silvennoinen, R., Anttila, P., **Dowling, P.**, O'Gorman, P., Tang, J., Heckman, C.A. (2021) S100 Calcium Binding Protein Family Members Associate With Poor Patient Outcome and Response to Proteasome Inhibition in Multiple Myeloma. *Front Cell Dev Biol*. 9:723016.

Moloney, N.M., Larkin, A., Xu, L., **Fitzpatrick, D.A.**, Crean, H., Walshe K., Haas, H., Decristoforo C. and **Doyle, S.** (2021) Semi-synthetic siderophore-immunogen conjugate and a derivative recombinant triacetyl fusarinine C-specific monoclonal antibody with fungal diagnostic application. *Analytical Biochemistry*. MS ID: YABIO-D-21-00167R1. Accepted 13 September 2021.

Ude, Z., Flothkötter, N., Sheehan, G., Brennan, M., **Kavanagh, K.**, Marmion, C.J. (2021) Multi-Targeted Metallo-Ciprofloxacin Derivatives Rationally Designed and Developed to Overcome Antimicrobial Resistance. *Int J Antimicrob Agents*. 106449. doi: 10.1016/j.ijantimicag.2021.106449. Epub ahead of print. PMID: 34644603.

95. Felice, V., **Owens, R.**, Kennedy, D., Hogan, S. and Lane, J. (2021) Comparative Structural and Compositional Analyses of Cow, Buffalo, Goat and Sheep Cream. *Foods*, 10(11), 2643; <https://doi.org/10.3390/foods10112643>.

Dowling, P., Tierney, C., Dunphy, K., Miettinen, J.J., Heckman, C.A., Bazou, D., O'Gorman, P. (2021) Identification of Protein Biomarker Signatures for Acute Myeloid Leukemia (AML) Using Both Nontargeted and Targeted Approaches. *Proteomes*. 9(4):42. doi: 10.3390/proteomes9040042.

Margalit, A., **Carolan, J.C.** and **Walsh, F.** (2021) Global protein responses of multi-drug resistant plasmid containing *Escherichia coli* to ampicillin, cefotaxime, imipenem and ciprofloxacin. *J Glob Antimicrob Resist.* S2213-7165(21)00277-0. doi: 10.1016/j.jgar.2021.12.006. Epub ahead of print.

2022 (n = 15)

Clarke, J., Grogan, H., **Fitzpatrick, D.**, **Kavanagh, K.** (2022) Analysis of the effect of *Bacillus velezensis* culture filtrate on the growth and proteome of *Cladobotryum mycophilum*. *Fungal Biol.* 126(1):11-19. doi: 10.1016/j.funbio.2021.09.003

Ward, R. Coffey, M.F. and **Kavanagh K.** (2022) Exposure of *Apis mellifera* to anti-Varroa destructor formic acid treatment induces significant proteomic alterations, *Journal of Apicultural Research*, DOI: [10.1080/00218839.2022.2038055](https://doi.org/10.1080/00218839.2022.2038055)

100. Margalit, A., Sheehan, D., **Carolan, J.C., Kavanagh, K.** (2022) Exposure to the *Pseudomonas aeruginosa* secretome alters the proteome and secondary metabolite production of *Aspergillus fumigatus*. *Microbiology (Reading)*. 168(3). doi: 10.1099/mic.0.001164.

Lillis, P.E., **Griffin, C.T., Carolan, J.C.** (2022) The effect of temperature conditioning (9°C and 20°C) on the proteome of entomopathogenic nematode infective juveniles. *PLoS ONE* 17(4): e0266164. <https://doi.org/10.1371/journal.pone.0266164>

Drumm, S.D., Cormican, P., O'Boyle, P., **Owens, R.A.**, Mitchell, J., Keane, O. M. (2022) Immunoproteomic analysis of the secretome of bovine-adapted strains of *Staphylococcus aureus* demonstrates a strain-specific humoral response. *Veterinary Immunology and Immunopathology*. 110428, ISSN 0165-2427, <https://doi.org/10.1016/j.vetimm.2022.110428>.

Clarke, J., Grogan, H., **Fitzpatrick, D.** and **Kavanagh, K.** (2022) Characterising the proteomic response of mushroom pathogen *Lecanicillium fungicola* to *Bacillus velezensis* QST 713 and Kos biocontrol agents. *Eur J Plant Pathol.* 163(2):369-379. <https://doi.org/10.1007/s10658-022-02482-1>

Ward, R., Coffey, M., **Kavanagh, K.** (2022) Proteomic analysis of summer and winter *Apis mellifera* workers shows reduced protein abundance in winter samples. *J Insect Physiol.* 7:104397. doi: 10.1016/j.jinsphys.2022.104397. Epub ahead of print.

105. Piatek, M., O'Beirne, C., Beato, Z., Tacke, M. and **Kavanagh K.** (2022) Exposure of *Candida parapsilosis* to the silver(I) compound SBC3 induces alterations in the proteome and reduced virulence. *Metallomics.* mfac046. doi: 10.1093/mtomcs/mfac046.

Dowling, P., Gargan, S., Swandulla, D. and **Ohlendieck K.** (2022) Proteomic profiling of impaired excitation-contraction coupling and abnormal calcium handling in muscular dystrophy. *Proteomics.* e2200003. doi: 10.1002/pmic.202200003.

Karahoda B., Pardeshi L., Ulas M., Dong Z., Shirgaonkar N., Guo S., Wang F., Tan K., Sarikaya-Bayram Ö., Bauer I., **Dowling P.**, Fleming A.B., Pfannenstiel B.T., Luciano-Rosario D., Berger H., Graessle S., Alhussain M.M., Strauss J., Keller N.P., Wong K.H. and **Bayram Ö.** (2022) The KdmB-EcoA-RpdA-SntB chromatin complex binds regulatory genes and coordinates fungal development with mycotoxin synthesis. *Nucleic Acids Res.* doi: 10.1093/nar/gkac744.

Doyle, S., Cuskelly, D.D., Conlon, N., **Fitzpatrick, D.A.**, Gilmartin, C.B., Dix, S.H., Jones, G.W. (2022) A Single *Aspergillus fumigatus* Gene Enables Ergothioneine Biosynthesis and Secretion by *Saccharomyces cerevisiae*. *Int. J. Mol. Sci.* 23, 10832. <https://doi.org/10.3390/ijms231810832>

Lillis, P.E., Kennedy, I.P., **Carolan, J.C.**, **Griffin, C.T.** (2022) Low-temperature exposure has immediate and lasting effects on the stress tolerance, chemotaxis and proteome of entomopathogenic nematodes. *Parasitology*. 1-14. doi: 10.1017/S0031182022001445.

110. Conlon, N., Murphy, R.A., Corrigan, A., **Doyle, S., Owens, R.A.** and Fagan S. (2022) Quantitative Proteomic Analysis Reveals Yeast Cell Wall Products Influence the Serum Proteome Composition of Broiler Chickens. *Int J Mol Sci.* 23(19):11844. doi: 10.3390/ijms231911844

Kunc M, Dobeš P, Ward R, Lee S, Čegan R, Dostálková S, Holušová K, Hurýchová J, Eliáš S, Pindáková E, Čukanová E, Prodělalová J, Petřívalský M, Danihlík J, Havlík J, Hobza R, **Kavanagh, K.**, Hyršl P. (2022) Omics-based analysis of honey bee (*Apis mellifera*) response to Varroa sp. parasitisation and associated factors reveals changes impairing winter bee generation. *Insect Biochem Mol Biol.* 103877. doi: 10.1016/j.ibmb.2022.103877.

Cullen, M.G., Bliss, L., Stanley D.A., **Carolan, J.C.** (2022) Investigating the effects of glyphosate on the bumblebee proteome and microbiota. *Sci Total Environ.* 161074. doi: 10.1016/j.scitotenv.2022.161074.

2023 (n = 17 to date)

Murphy, S., Zweyer, M., Swandulla, D. **Ohlendieck, K.** (2023) Bioinformatic Analysis of the Subproteomic Profile of Cardiomyopathic Tissue. *Methods Mol Biol.* 2596:377-395. doi: 10.1007/978-1-0716-2831-7_26. PMID: 36378452.

Murphy, S., **Ohlendieck, K.** (2023) Protein Digestion for 2D-DIGE Analysis. *Methods Mol Biol.* 2596:339-349. doi: 10.1007/978-1-0716-2831-7_23. PMID: 36378449.

115. Dowling, P., Gargan, S., Swandulla, D., **Ohlendieck, K.** (2023) Identification of Subproteomic Markers for Skeletal Muscle Profiling. *Methods Mol Biol.* 2596:291-302. doi: 10.1007/978-1-0716-2831-7_20. PMID: 36378446.

Ohlendieck, K. (2023) Two-CyDye-Based 2D-DIGE Analysis of Aged Human Muscle Biopsy Specimens. *Methods Mol Biol.* 2596:265-289. doi: 10.1007/978-1-0716-2831-7_19. PMID: 36378445.

Ohlendieck, K. (2023) Comparative 3-Sample 2D-DIGE Analysis of Skeletal Muscles. *Methods Mol Biol.* 2596:127-146. doi: 10.1007/978-1-0716-2831-7_11. PMID: 36378437.

Ohlendieck, K. (2023) Top-Down Proteomics and Comparative 2D-DIGE Analysis. *Methods Mol Biol.* 2023;2596:19-38. doi: 10.1007/978-1-0716-2831-7_2. PMID: 36378428.

Curtis, A., Ryan, M. and **Kavanagh, K.** (2023) Exposure of *Aspergillus fumigatus* to *Klebsiella pneumoniae* Culture Filtrate Inhibits Growth and Stimulates Gliotoxin Production. Journal of Fungi 9(2): 222. <https://doi.org/10.3390/jof9020222>

120. Dowling, P., Gargan, S., Swandulla, D. and **Ohlendieck, K.** (2023) Fiber-Type Shifting in Sarcopenia of Old Age: Proteomic Profiling of the Contractile Apparatus of Skeletal Muscles. International Journal of Molecular Sciences 24(3):2415. <https://doi.org/10.3390/ijms24032415>

Curtis, A., Ryan, M. and **Kavanagh, K.** (2023) Exposure of *Aspergillus fumigatus* to *Klebsiella pneumoniae* Culture Filtrate Inhibits Growth and Stimulates Gliotoxin Production. J Fungi (Basel). 9(2):222. doi: 10.3390/jof9020222.

Piatek, M., O'Beirne, C., Beato, Z., Tacke, M. and **Kavanagh K.** (2023) *Pseudomonas aeruginosa* and *Staphylococcus aureus* Display Differential Proteomic Responses to the Silver(I) Compound, SBC3. Antibiotics (Basel). 12(2):348. doi: 10.3390/antibiotics12020348.

Traynor, A.M., Sarikaya-Bayram, Ö., Bayram, Ö., Calera J.A., and **Doyle, S.** (2023) Proteomic dissection of role of GliZ in gliotoxin biosynthesis in *Aspergillus fumigatus*. Fungal Genetics and Biology. Accepted 1 April 2023.

Curtis, A., Walshe, K., **Kavanagh, K.** (2023) Prolonged Subculturing of *Aspergillus fumigatus* on *Galleria* Extract Agar Results in Altered Virulence and Sensitivity to Antifungal Agents. Cells. 12(7):1065. doi: 10.3390/cells12071065.

125. Murphy, S., Schmitt-John, T., **Dowling, P.**, Henry, M., Meleady, P., Swandulla, D., **Ohlendieck, K.** 2023. Proteomic profiling of the brain from the *wobbler* mouse model of amyotrophic lateral sclerosis reveals elevated levels of the astrogliosis marker glial fibrillary acidic protein. Eur J Transl Myol. doi: 10.4081/ejtm.2023.11555.

Dunphy, K., Bazou, D., Henry, M., Meleady, P., Miettinen, J.J., Heckman, C.A., **Dowling, P.**, O'Gorman, P. 2023. Proteomic and Metabolomic Analysis of Bone Marrow and Plasma from Patients with Extramedullary Multiple Myeloma Identifies Distinct Protein and Metabolite Signatures. Cancers (Basel). 15(15):3764. doi: 10.3390/cancers15153764.

Schwarze, J., **Carolan, J.C.**, Stewart, G.S., McCabe, P.F., Kacprzyk, J. 2023. The boundary of life and death: changes in mitochondrial and cytosolic proteomes associated with programmed cell death of *Arabidopsis thaliana* suspension culture cells. Front Plant Sci. 14:1194866. doi: 10.3389/fpls.2023.1194866.

Karahoda, B., Pfannenstiel, B.T., **Sarikaya-Bayram, Ö.**, Dong, Z., Ho Wong, K., Fleming, A.B., Keller, N.P., **Bayram Ö.** (2023) The KdmB-EcoA-RpdA-SntB (KERS) chromatin regulatory complex controls development, secondary metabolism and pathogenicity in *Aspergillus flavus*. Fungal Genet Biol. 103836. doi: 10.1016/j.fgb.2023.103836.

129. Dowling, P., Swandulla, D., **Ohlendieck, K.** (2023) Biochemical and proteomic insights into sarcoplasmic reticulum Ca²⁺-ATPase complexes in skeletal muscles. Expert Rev Proteomics. doi: 10.1080/14789450.2023.2255743.

Professor Sean Doyle

at 6 September 2023