Prof. Suzanne Cory
Professor

Most important awards, prizes and academies

Awards: David Syme Prize, University of Melbourne (1982); Lemberg Medal, Australian Society for Biochemistry & Molecular Biology (1995); Burnet Medal, Australian Academy of Science (1997); Australia Prize (shared) (1998); Charles S. Mott Prize (shared), General Motors Cancer Research Foundation (1998); L'Oreal – UNESCO Women in Science Award (2001); Royal Medal, Royal Society (2002); Centenary of Federation Medal, Australia (2003); Pearl Meister Greengard Prize (2009); Colin Thomson Medal for Cancer Research (2011); CSIRO Eureka Prize for Leadership in Science (2012). *Academies*: Australian Academy of Sciences (1986); Royal Society (1992); American Association for Immunology (1993); US National Academy of Science (1997); American Academy of Arts and Sciences (2001); French Academy of Sciences (2002); Japan Academy (2013); American Association for Cancer Research Academy (2013).

Summary of scientific research

Suzanne Cory's research has had a major impact on the understanding of immunology and the development of cancer. After pioneering Ph.D. studies determining the sequence of methionine transfer RNA, using the sequencing methods that had just been developed by Fred Sanger, her post-doctoral studies at the University of Geneva focused on sequence analysis of R17 phage RNA a model messenger RNA. Cory returned to Melbourne in 1971 to The Walter and Eliza Hall

Institute (WEHI) with her scientific and life partner, Jerry M Adams. During the first few years, Cory and Adams discovered 5' caps on mammalian messenger RNAs, helped to introduce gene cloning technology in Australia, and addressed a central puzzle regarding the immune response: how does the body make the myriad antibodies needed to fight diverse infectious agents? Their laboratory helped uncover the astonishing solution: antibody genes are encoded as bits and pieces which can combine in a myriad ways, thereby creating much greater diversity with which to fight infection. In 1981, their attention turned to the nature of the genetic accidents that cause cancer. Their laboratory showed that damage to chromosomes can activate cancer-promoting genes. They tracked down the mutation which activates the oncogene *MYC* and leads to Burkitt's lymphoma, a malignancy of antibody-producing cells. In collaboration with Alan Harris, they then engineered novel lines of lymphoma-prone mice, to study the early stages of disease and test for synergistic mutations. The current focus of their research is how cells decide whether to live or die. This program was launched in 1988 by the seminal finding of David Vaux in their laboratory that *BCL-2*, the gene responsible for follicular lymphoma, promotes cell survival. This discovery opened an entirely new way of thinking about cancer development, since all other oncogenes (cancer-causing genes) had been found to promote cell proliferation. The *BCL-2* gene proved to have numerous relatives, and some actually promote cell death (apoptosis) rather than cell survival. Cory and Adams were leaders in a major program at the Hall Institute directed to understanding how apoptosis is controlled, influences normal development and contributes to cancer and other diseases. This knowledge led to a research collaboration agreement between WEHI and US companies Genentech and Abbot Laboratories (now AbbVie) to develop BH3 mimetics, drugs that mimic the action of the natural triggers of apoptosis by binding to and blocking the action of BCL-2 and other pro-cell survival relatives. Venetoclax, the FDA-approved anti-BCL-2 drug developed during this collaboration is having major success in treating chronic lymphocytic leukemia and other lymphoid malignancies.

Main publications

Adams, J.M. and Cory, S., Modified nucleosides and bizarre 5'-termini in mouse myeloma rnRNA, *Nature*, 255, pp. 28-33 (1975); Cory, S. and Adams, J.M., Deletions are associated with somatic rearrangement of immunoglobulin heavy chain genes, *Cell*, 19, pp. 37-51 (1980); Adams, J.M., Gerondakis, S., Webb, E., Corcoran, L.M. and Cory, S., Cellular *myc*oncogene is altered by chromosome translocation to an immunoglobulin locus in murine plasmacytomas and rearranged similarly in Burkitt lymphomas of man, *Proc. Natl. Acad. Sci. USA*, 80, pp. 1982-6 (1983); Corcoran, L.M., Adams, J.M., Dunn, A.R. and Cory, S., Murine T lymphomas in which the cellular *myc* oncogene has been activated by retroviral insertion, *Cell*, 37, pp. 113-22 (1984); Adams, J.M., Harris, A.W., Pinkert, C.A., Corcoran, L.M., Alexander, W.S., Cory, S., *et al.*, The *c-myc* oncogene driven by immunoglobulin enhancers induces lymphoid malignancy in transgenic mice, *Nature*, 318, pp. 533-8 (1985); Vaux, D., Cory, S. and Adams, J.M., *Bcl-2* gene promotes haematopoietic cell survival and cooperates with *c-myc* to immortalize pre-B cells, *Nature*, 335, pp. 440-2 (1988); Strasser, A., Harris, A.W., Bath, M.L. and Cory, S., Novel primitive lymphoid

tumours induced in transgenic mice by cooperation between *myc* and *bcl-2*, *Nature*, 348, pp. 331-3 (1990); Rosenbaum, H., Harris, A.W., Bath, M.L., McNeall, J., Webb, E., Adams, J.M. and Cory, S., An *Eμ-v-abl* transgene elicits plasmacytomas in concert with an activated myc gene, *EMBO J.*, 9, pp. 897-905 (1990); Elefanty, A.G., Hariharan, I.K. and Cory, S., *bcr-abl*, the hallmark of chronic myeloid leukaemia in man, induces multiple haemopoietic neoplasms in mice, *EMBO J.*, 9, pp. 1069-78 (1990); Perkins, A., Kongsuwan, K., Visvader, J., Adams, J.M. and Cory, S., Homeobox gene expression plus autocrine growth factor production elicits myeloid leukemia, *Proc. Natl. Acad. Sci. USA*, 87, pp. 8398-8402 (1990); Strasser, A., Harris, A.W. and Cory, S., *bcl-2*transgene inhibits T cell death and perturbs thymic self-censorship, *Cell*, 67, pp. 889-99 (1991); Adams, J.M. and Cory, S., The *Bcl-2* protein family: arbiters of cell survival,*Science*, 281, pp. 1322-26 (1998); Print, C.G., Loveland, K.L., Gibson, L., Meehan, T., Stylianou, A., Wreford, N., de Kretser D., Metcalf, D., Kontgen, F., Adams, J.M. and Cory, S., Apoptosis regulator *Bcl-w* is essential for spermatogenesis but appears otherwise redundant, *Proc. Natl. Acad. Sci. USA*, 95, pp. 12424-31 (1998); Bouillet, P., Purton, J.F., Godfrey, D.I., Zhang, L.C., Coultas, L., Puthalakath, H., Pellegrini, M., Cory, *et al.*,*BH3*-only *Bcl-2* family member Bim is required for apoptosis of autoreactive thymocytes, *Nature*, 415, pp. 922-6 (2002); Cory, S., Adams, J.M., The *Bcl2* family: regulators of the cellular life-or-death switch, *Nat. Rev. Cancer*, 2(9), pp. 647-56 (2002); Egle, A., Harris, A.W., Bath, M.L., O'Reilly, L., Cory, S., *VavP-Bcl2* transgenic mice develop follicular lymphoma preceded by germinal center hyperplasia, *Blood*, 103(6), pp. 2276-83 (2004); Egle, A., Harris, A.W., Bouillet, P., Cory, S., BIM is a suppressor of *Myc*-induced mouse B cell leukaemia, *Proc. Natl. Acad. Sci. USA*, 101(16), pp. 6164-9 (2004); van Delft, M.F., Wei, A.H., Mason, K.D., Vandenberg, C.J., Chen, L., Czabotar, P.E., Willis, S.N., Scott, C.L., Day, C.L., Cory, S., *et al.*, The *BH3* mimetic ABT-737 targets selective *Bcl-2* proteins and efficiently induces apoptosis via Bak/Bax if *Mcl-1* is neutralized, *Cancer Cell.*, 10(5), pp. 389-99 (2006); Adams JM, Cory S., The Bcl-2 Apoptotic Switch in Cancer Development and Therapy. *Oncogene,* 26, pp 1324-1337 (2007); Campbell K.J., Bath M., Turner M.L., Vandenberg C.J., Bouillet P., Metcalf D., Scott C.L., Cory S., Elevated Mcl-1 perturbs lymphopoeisis, promotes transformation of hematopoietic stem/progenitor cells and enhances drug resistance, *Blood* 116, pp. 3197-207 (2010); Vandenberg C.J., Cory S., ABT-199, a new Bcl-2 specific BH3 mimetic, has in vivo efficacy against aggressive Myc-driven mouse lymphomas without provoking thrombocytopenia, *Blood* 121, pp. 2285-8 (2013); Cory S., Roberts A.W., Colman P.M., Adams J.M., Targeting BCL-2-like proteins to kill cancer cells, *Trends in Cancer* 2, pp. 443-450 (2016); Adams J.M. and Cory S., The BCL-2 arbiters of apoptosis and their growing role as cancer targets, *Cell Death Differ.*, 25, pp. 27-36 (2018); Anstee N.S., Bilardi R.A., Ng A.P., Xu Z., Robati M., Vandenberg C.J., Cory S., Impact of elevated anti-apoptotic MCL-1 and BCL-2 on the development and treatment of MLL-AF9 ALL in mice, *Cell Death Differ*, 26, pp. 1316-1331 (2019); Nguyen H.V., Vandenberg C.J., Ng A.P., Robati M.R., Anstee N.S., Rimes J., Hawkins E.D,. Cory S., Development and survival of MYC-driven lymphomas require the MYC antagonist MNT to curb MYC-induced apoptosis, *Blood*, 135(13), pp. 1019-1031 (2020).