BIOGRAPHICAL SKETCH

NAME: **Simon C. Robson. M.B., Ch.B., FRCP, Ph.D.**

eRA COMMONS USER NAME (credential, e.g., agency login): **SIMONROBSON**

POSITION TITLE: Professor of Anesthesia, Vice-Chair Research, Department of Anesthesia. Joseph J. and Josephine A. Gazzola Chair in Inflammation Research and Charlotte F. & Irving W. Rabb Distinguished Professor of Gastroenterology and Hepatology, Department of Medicine: Beth Israel Deaconess Medical Center, Harvard Medical School, Boston MA

**EDUCATION/TRAINING**

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Cape Town, South Africa | M.B. Ch.B. | 12/1978 | Medicine |
| University of Cape Town, South Africa | Ph.D. | 12/1989 | Immunology |
| Royal College of Physicians, London | MRCP; FRCP | 12/1982, 05/1996 | Int. Medicine / Hepatology |
| College of Medicine, South Africa | DCH; FCP | 10/1981, 1984 | Pediat; Int. Medicine |
| American Board of Internal Medicine | Dipl. Med. | 12/2001Recertified 12/2011 and Current LKA  | Int. Medicine |

**Personal Statement**
I am a physician scientist at the Beth Israel Deaconess Medical Center (BIDMC), Harvard Medical School (HMS) and clinically active in Hepatology and Transplantation. I served as the Chief of Gastroenterology, Hepatology & Endoscopy, to the end-2015, at BIDMC. I conduct basic and translational research in my own laboratory at the BIDMC as well as coordinating investigation with collaborators within the Department of Medicine. I am also appointed as Professor of Anesthesiology and currently serve as the Director of the newly formed “Center for Inflammation Research” and as Vice Chairman of Research within the Department of Anesthesia, Critical Care and Pain Medicine.

My major area of basic science and translational research involves innovative work in purinergic signaling, primarily studying ectonucleotidases, which others, and we, have characterized as vascular, myeloid and regulatory T and B lymphoid cell expressed ecto-enzymes e.g. CD39, CD39L3 and NPP/autotaxin. The immune functions of such ecto-enzymes are to hydrolyze pro-inflammatory extracellular nucleotides and phospholipids to immune suppressive adenosine and other derivatives. In addition, I have specialist knowledge of purinergic biology in the clinical setting of inflammation and in transplantation, and I care actively for patients in the Liver Clinic/Transplantation and with the Multi-disciplinary Liver Tumor Group.

We have proposed that the expression of these ectonucleotidases, and/or their therapeutic targeting, would have major protective effects in multiple inflammatory diseases and in transplantation. To that end, I have over two decades of experience in studies of purinergic signaling, immunometabolism, and vascular biology in transplantation, inflammatory diseases and cancer. Extracellular adenosine generated by the ectonucleotidases CD39 (and CD73) is now recognized as a “immune checkpoint mediator”.

I am now focused on the role of CD39 in modulating immune responses and angiogenesis and have embarked on several translational endeavors to target this dominant immune and vascular ectonucleotidase. These efforts extend to developing innovative models and reagents to study and better manage acute and chronic inflammatory diseases of the heart, lungs, liver and intestine and the related complications, includive of cancer.

**Highlighted publications:**

1. Deaglio S, Dwyer KM, Gao W, Friedman D, Usheva A, Erat A, Chen JF, Enjyoji K, Linden J, Oukka M, Kuchroo VK, Strom TB, **Robson SC.** Adenosine generation by CD39 and CD73 on T regulatory cells mediates immune suppression. Journal of Experimental Medicine. 2007 Jun 11;204(6):1257-65. PMCID: PMC2118603. >*2250 citations.*
2. Eltzschig H, Sitkovsky M & **Robson SC**. Purinergic signaling during inflammation. New England Journal of Medicine 2012 Dec 13;367(24):2322-33. PMCID: PMC3675791. >*500 citations.*
3. Harshe RP, Xie A, Vuerich M, Frank LA, Gromova B, Zhang H, Robles RJ, Mukherjee S, Csizmadia E, Kokkotou E, Cheifetz AS, Moss AC, Kota SK, **Robson SC & Longhi MS**.[Endogenous antisense RNA curbs CD39 expression in Crohn'**s** disease.](https://pubmed.ncbi.nlm.nih.gov/33208731/) Nat Commun. 2020 Nov 18;11(1):5894. doi: 10.1038/s41467-020-19692-y.PMID: 33208731.
4. Zhang H, Feng L, de Andrade Mello P, Mao C, Near R, Csizmadia E, Chan LL, Enjyoji K, Gao W, Zhao H, **Robson SC**. [Glycoengineered anti-CD39 promotes anticancer responses by depleting suppressive cells and inhibiting angiogenesis in tumor models.](https://pubmed.ncbi.nlm.nih.gov/35775486/) J Clin Invest. 2022 Jul 1;132(13):e157431. doi: 10.1172/JCI157431.PMID: 35775486.

**Ongoing and recently completed projects that I would like to highlight include:**

* R01DK108894. Longhi (PI). Robson (Co-I). 02/01/17-01/31/22 NCE. Immunomodulatory effects of bilirubin are mediated through the aryl hydrocarbon receptor, O2 and purinergic pathways. The goal of this project is to determine the mechanisms underlying the immunosuppressive properties of unconjugated bilirubin on Tregs.
* R01 DK124408. Longhi (PI). Robson (Co-I). 09/15/20-08/31/23 . Alterations of aryl hydrocarbon receptor signaling in autoimmune hepatitis. The goal is to study elements of AHR signaling, transcriptional regulation and purinergic signaling in AI CAH.
* R21CA221702. Robson/David Avigan (PDs/PIs). 03/01/18-02/28/2020. Directed Purinergic Signaling as Immunotherapy in Leukemia. We developed antibody inhibitors of CD39 ectonucleotidase as therapies for immune exhaustion in cancer and for other indications.
* Emerson Collective Cancer Research Fund. Robson (PI). 12/01/21-11/30/2023.Targeting ENTPD3 to boost extracellular ATP and inflame tumors. We will examine role of ENTPD3 in cancer metabolism and target this ectonuceotdase in models of colorectal cancer and in cachexia.

# B. ****Positions, Scientific Appointments and Honors****Positions and Scientific Appointments

2020- Joseph J. and Josephine A. Gazzola Chair in Inflammation Research.

2018- Professor of Anesthesia, Director of Center for Inflammation Research, and Vice-Chair Research.

2018-21 Specialty Content Physician Editor in Gastroenterology, DynaMed.

2014-17 HMS Promotions and Reappointments Committee

2014- Faculty Member of Dana Farber/Harvard Cancer Center and BIDMC Cancer Center

2014- Faculty Member Harvard Immunology Program

2012-15 Chief of Gastroenterology and Hepatology, Dept of Medicine, BIDMC

2012- ***Editorial Boards*:** Purinergic Signaling (Associate Editor), Transplantation and Xenotransplantation, Nature Molecule Pages, Hematology Research and Reviews, Faculty of 1000, Journal of Transplantation and Innate Immunity.

2006- Professor of Medicine, Harvard University

2000 Associate Professor of Medicine, Harvard Medical School

2002- Director of Liver Research, Liver Center, BIDMC

1999- Reviewer: NIH SAT, ACIS, JDRF, Italian MIUR, AHA and others

1999-02. American Association Study of Liver Diseases Research Committee

1998- Committee for Biosafety in Xenotransplantation, Harvard Medical School

1996-99: Associate Professor of Medicine (Visiting), Harvard Medical School, Boston

1996- Attending Physician in Gastroenterology and Transplantation, BIDMC

1992-94 Secretary-Treasurer of South African Immunology Society

 & African Association for the Study of Liver Disease

1993-96: Associate Professor: Department of Medicine and Liver Clinic, University of Cape Town

1994-98: Associate Scientist, Department of Surgery, Harvard Medical School, Boston

1992-94: Deputy Director, MRC UCT Liver Centre, University of Cape Town

1990-93: Senior Specialist, Liver Clinic and Medical Director Liver Transplantation Program

1990-93 University of Cape Town Professional Standards Committee

1987-89: Specialist Physician, Departments of Medicine and Surgery, Liver Clinic, Groote Schuur Hospital

1985-87: Senior Research Fellow, Liver Centre and Clinical Science, University of Cape Town

1983-85: Registrar, Department of Medicine, Groote Schuur Hospital, Cape Town, South Africa

1982-83: Registrar and Research Fellow, Liver Unit, Kings College Hospital, London, England

1981-82: Medical Officer, General Medicine, Warwick Hospital, Warwick, England

1979-80: Senior House Officer in Obstetrics, Gynaecology, Paediatrics (including Neonatology) and Cardiology, Groote Schuur Hospital, Red Cross Children’s Hospital, Cape Town South Africa

1978-79: Intern, Addington Hospital, Durban, South Africa

**Honors:**

2020 Joseph J. and Josephine A. Gazzola Chair in the Field of Inflammation Research.

2018-21 Subcommittee of Professors, Harvard Medical School.

2018 PURINES2018 – Plenary Lecture and Keynote, Iguaqu, Brazil.

2016 Keystone Conference J5 – Purinergic Signaling – Keynote Speaker, Vancouver.

2016. Recipient of Excellence in Ambulatory Student Teaching in Subspecialty Medicine

2015 Elected Fellow of Royal College of Physicians of Ireland (Hon)

Fellow of AASLD

Recipient of Excellence in Ambulatory Student Teaching in Subspecialty Medicine; Harvard Medical School (HMS) Teaching Award

 TSANZ Visiting Professor (Immunology) and Harvard Australia Harvard Fellowship

2012- Charlotte F. & Irving W. Rabb Chair of Medicine at Harvard Medical School

2010 Robert C. Moellering prize for excellence in research, teaching and clinical practice at BIDMC, Harvard Medical School

2008 Named lectures: Third Geoffrey Burnstock Lecture, Purines Conference 2008;
Thirtieth Bernard Pimstone Lecture at University of Cape Town et andere

1996 Fellow of Royal College of Physicians of London

1990 Gold Medal, South African Immunology Society

1986 MRC Career Advancement Award; MRC International Study Award

**C. Contributions to Science**

1. Innovative studies with respect to expression, regulation (e.g. oxygen and xenobiotics via arylhydrocarbon receptor), structure and post translational changes (glycosylation) of vascular and immune ectonucleotidases of the CD39 family.
2. [Friedman DJ](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Friedman%20DJ%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Künzli BM](http://www.ncbi.nlm.nih.gov/pubmed?term=%22K%C3%BCnzli%20BM%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [A-Rahim YI](http://www.ncbi.nlm.nih.gov/pubmed?term=%22A-Rahim%20YI%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Sevigny J](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Sevigny%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Berberat PO](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Berberat%20PO%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Enjyoji K](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Enjyoji%20K%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Csizmadia E](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Csizmadia%20E%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract), [Friess H](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Friess%20H%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstract),

**Robson SC**. CD39 deletion exacerbates experimental murine colitis and human polymorphisms increase susceptibility to inflammatory bowel disease. Proc Natl Acad Sci U S A. 2009 Sep 29;106(39):16788-93. Epub 2009 Sep 28. PMID: 19805374. PMCID: PMC2757811.

1. **Longhi MS**, Vuerich M, Kalbasi A, Kenison JE, Yeste A, Csizmadia E, Vaughn B, Feldbrugge L, Mitsuhashi S, Wegiel B, Otterbein L, Moss A, Quintana FJ, **Robson SC.** [Bilirubin suppresses Th17 immunity in colitis by upregulating CD39.](https://www.ncbi.nlm.nih.gov/pubmed/28469075) JCI Insight. 2017 May 4;2(9). pii: 92791. PMID: 28469075. PMCID: [PMC5414551](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5414551/). doi: 10.1172/jci.insight.92791.
2. Zhong AH, Gordon Jiang Z, Cummings RD, **Robson SC**. Various N-glycoforms differentially upregulate E-NTPDase activity of the NTPDase3/CD39L3 ecto-enzymatic domain. [Purinergic Signal.](https://www.ncbi.nlm.nih.gov/pubmed/28956227) 2017 Dec;13(4):601-609. doi: 10.1007/s11302-017-9587-y. PMID: 28956227. PMCID: [PMC5714850](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5714850/)
3. Zhong EH, Ledderose C, De Andrade Mello P, Enjyoji K, Lunderberg JM, Junger W, **Robson SC.** [Structural and functional characterization of engineered bifunctional fusion proteins of CD39 and CD73 ectonucleotidases.](https://pubmed.ncbi.nlm.nih.gov/33052071/) Am J Physiol Cell Physiol. 2021 Jan 1;320(1):C15-C29. doi: 10.1152/ajpcell.00430.2020. Epub 2020 Oct 14.PMID: 33052071.
4. Translational applications with respect to the modulation of ectonucleotidases in ischemia, thrombosis and vascular remodeling in inflammatory disease, diabetes and cancer. Pertinent examples include CD39 being coupled to biodegradable polymers, which may be administered systemically to ameliorate inflammatory responses. In contrast, biological reagents targeting CD39 serve as anti-angiogenic and putative check point inhibitors
5. Mascanfroni ID, Takenaka MC, Yeste A, Patel B, Wu Y, Kenison JE, Siddiqui S, Basso AS, Otterbein LE, Pardoll DM, Pan F, Priel A, Clish CB, **Robson SC** & Quintana FJ. Metabolic control of type 1 regulatory T cell differentiation by AHR and HIF1-α. Nature Med. 2015 Jun;21(6):638-46. doi: 10.1038/nm.3868. PMID: 26005855.
6. Savio, L.E.B., de Andrade Mello, P., Figliuolo, V.R., de Avelar Almeida, T.F., Santana, P.T., Oliveira, S.D.S., Silva, C.L.M., Feldbrugge, L., Csizmadia, E., Minshall, R.D., **Longhi, M.S**., Wu, Y., **Robson, S.C.** & Coutinho-Silva, R. (Joint senior; corresponding). CD39 limits P2X7 receptor inflammatory signaling and attenuates sepsis-induced liver injury. J Hepatol 2017 **67**, 716-726.
7. **Robson SC**, Sévigny J, Zimmermann H. [The E-NTPDase family of ectonucleotidases: structure function relationships and pathophysiological significance](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=aeMlmvwAAAAJ&citation_for_view=aeMlmvwAAAAJ:u-x6o8ySG0sC). Purinergic Signalling 2006. 2 (2), 409-430. doi: [10.1007/s11302-006-9003-5](https://doi.org/10.1007/s11302-006-9003-5) (>1,000 citations).
8. [Allard B](https://www.ncbi.nlm.nih.gov/pubmed/?term=Allard%20B%5BAuthor%5D&cauthor=true&cauthor_uid=28258700), [**Longhi MS**](https://www.ncbi.nlm.nih.gov/pubmed/?term=Longhi%20MS%5BAuthor%5D&cauthor=true&cauthor_uid=28258700), [**Robson SC**](https://www.ncbi.nlm.nih.gov/pubmed/?term=Robson%20SC%5BAuthor%5D&cauthor=true&cauthor_uid=28258700) & [Stagg J](https://www.ncbi.nlm.nih.gov/pubmed/?term=Stagg%20J%5BAuthor%5D&cauthor=true&cauthor_uid=28258700) (joint senior/corresponding). The ectonucleotidases CD39 and CD73: Novel checkpoint inhibitor targets. Immunol Rev. 2017 Mar;276(1):121-144. doi: 10.1111/imr.12528*. Highly cited.*
9. Discoveries in the area of purinergic signaling and detailed characterizations of the roles of extracellular nucleotides as vascular and immune cell mediators in inflammation and immune regulation (as in vascular disease and IBD).
10. Dwyer KM, Hanidziar D, Putheti P, Hill PA, Pommey S, McRae JL, Winterhalter A, Doherty G, Deaglio S, Koulmanda M, Gao W, **Robson SC\*,** Strom TB\* (\*joint senior). Expression of CD39 by human peripheral blood CD4+ CD25+ T cells denotes a regulatory memory phenotype. Am J Transplant. 2010; 10: 2410-2420. PMID: 20977632. PMCID: PMC2966025
11. [Mascanfroni ID](http://www.ncbi.nlm.nih.gov/pubmed/?term=Mascanfroni%20ID%5BAuthor%5D&cauthor=true&cauthor_uid=23995234)1, [Yeste A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Yeste%20A%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Vieira SM](http://www.ncbi.nlm.nih.gov/pubmed/?term=Vieira%20SM%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Burns EJ](http://www.ncbi.nlm.nih.gov/pubmed/?term=Burns%20EJ%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Patel B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Patel%20B%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Sloma I](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sloma%20I%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Wu Y](http://www.ncbi.nlm.nih.gov/pubmed/?term=Wu%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Mayo L](http://www.ncbi.nlm.nih.gov/pubmed/?term=Mayo%20L%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Ben-Hamo R](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ben-Hamo%20R%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Efroni S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Efroni%20S%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [Kuchroo VK](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kuchroo%20VK%5BAuthor%5D&cauthor=true&cauthor_uid=23995234), [**Robson SC**](http://www.ncbi.nlm.nih.gov/pubmed/?term=Robson%20SC%5BAuthor%5D&cauthor=true&cauthor_uid=23995234)& [Quintana FJ](http://www.ncbi.nlm.nih.gov/pubmed/?term=Quintana%20FJ%5BAuthor%5D&cauthor=true&cauthor_uid=23995234). IL-27 acts on DCs to suppress the T cell response and autoimmunity by inducing expression of the immunoregulatory molecule CD39. [Nat Immunol.](http://www.ncbi.nlm.nih.gov/pubmed/23995234) 2013 Oct;14(10):1054-63. PMID: 23995234. PMCID: PMC3964005
12. De Giorgi M, Enjyoji K, Jiang G, Csizmadia E, Mitsuhashi S, **Gumina RJ,** Smolenski RT, **Robson** SC. [Complete deletion of *Cd39* is atheroprotective in apolipoprotein E-deficient mice.](https://www.ncbi.nlm.nih.gov/pubmed/28487312) J Lipid Res. 2017 Jul;58(7):1292-1305. doi: 10.1194/jlr.M072132. Epub 2017 May 9. PMCID: [PMC5496028](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5496028/).
13. **Longhi MS**, Moss A, Jiang ZG, **Robson** SC. Purinergic signaling during intestinal inflammation. J Mol Med (Berl). 2017 Sep;95(9):915-925. doi: 10.1007/s00109-017-1545-1. PMID: 28547076.
14. Pioneering studies of abnormalities associated with coagulation and hemostasis in transplanted organs: including renal, cardiac and liver allografts and xenografts. This earlier work has opened up new therapeutic avenues with the development of transgenic animals that may result in ultimate clinical application of xenotransplantation.
15. Kuwaki K, Tseng YL, Dor FJ, Shimizu A, Houser SL, Sanderson TM, Lancos CJ, Prabharasuth DD, Cheng J, Moran K, Hisashi Y, Mueller N, Yamada K, Greenstein JL, Hawley RJ, Patience C, Awwad M, Fishman JA, **Robson SC**, Schuurman HJ, Sachs DH, Cooper DK. Heart transplantation in baboons using alpha1, 3-galactosyltransferase gene-knockout pigs as donors: initial experience. Nature Med. 2005; 11(1): 29-31. PMID: 15619628.
16. Knosalla C, Yazawa K, Behdad A, Bodyak N, Shang H, Buhler L, Houser S, Gollackner B, Griesemer A, Schmitt-Knosalla I, Schuurman HJ, Awwad M, Sachs DH, Cooper DK, Yamada K, Usheva A, **Robson SC**. (2009). Renal and cardiac endothelial heterogeneity impact acute vascular rejection in pig-to-baboon xenotransplantation. Am J Transplant. 9:1006-1016. PMID:19422330. PMCID: PMC2824173.
17. Bach FH, Winkler H, Ferran C, Hancock WW, **Robson SC**. Delayed xenograft rejection. Immunology Today 1996; 17: 379-384. PMID: 878349.
18. Cowan PJ, [**Robson SC**](https://www.ncbi.nlm.nih.gov/pubmed/?term=Robson%20SC%5BAuthor%5D&cauthor=true&cauthor_uid=26220018). Progress towards overcoming coagulopathy and hemostatic dysfunction associated with xenotransplantation. [Int J Surg.](https://www.ncbi.nlm.nih.gov/pubmed/26220018) 2015 Nov;23(Pt B):296-300. doi: 10.1016/j.ijsu.2015.07.682. PMID:26220018.

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