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Born**: 31 July 1977, Pondicherry, India**

SUMMARY:

I have been working in the area of synthetic organic chemistry since 1999 and using my chemistry skills I am helping the preclinical/clinical scientists in the development of new labelling strategies for molecular imaging of cancer (4-[^{18}F]Fluoroglutamine; metabolic imaging agent, [^{18}F]DMPO; oxidative damage, [^{18}F]ML-10; apoptotic marker, [^{11}C]Temozolamide; brain tumour, [^{64}Cu]/[^{68}Ga]labelled peptides for small cell lung cancer) and dementia ([^{18}F]labelled VCAM-1 nanobodies) using Positron Emission Tomography (PET) research. In addition I have been developing optical imaging probes (fluorescence and bioluminescence) for *in vitro* evaluation of cancer cells. Also organic contrast agents and [^{13}C]hyperpolarised probes for MR imaging. I have developed a potent inhibitor of Auto Inducers (AI-2) signaling (prevention of biofilm formation in teeth's and biomedical devices).

EDUCATION:

2006 - 2009	Ph.D (Medicinal Chemistry), Manchester Pharmacy School, University of Manchester, UK.
2005 - 2006	M.Phil (Medicinal Chemistry), Manchester Pharmacy School, University of Manchester, UK.
1994 - 1998	B.Pharmacy (68%) Dr. M.G.R Medical University, Chennai (Madras), India.
1992 - 1994	H.Sc., (74%) from BSE, Chennai (Madras), India.
1990 - 1992	S.S.L.C. (72%) from BSE, Chennai (Madras), India.

Professional qualifications

- Member of Royal Society of Chemistry (**MRSC**), Member of Radiochemistry group, Member of Pharmacy Council of India (**PCI**) and Federation of Red Cross Society.

EMPLOYMENT:

01/07/2017 – Present: Lecturer in Medicinal Chemistry, WMIC and Manchester Pharmacy School, University of Manchester.

12/10/2016 – 24/12/2016: Visiting Research Fellow, Department of Radiology, **Johns Hopkins University**, Baltimore, USA. Awarded research travel fund from CRUK to work on "PET Imaging of a Substance P Antagonist G analogue (SPG) on Small Cell Lung Cancer (SCLC) using [^{68}Ga]NOTA-bombesin". I worked closely with Prof. Zaver Bhujwalla and Prof. Martin Pomper.

01/01/2016 – 30/06/2017: Research Fellow, WMIC and Manchester Pharmacy School, University of Manchester: (1) Radiosynthesis of 4-[^{18}F]Fluoroglutamine/L-[5-^{11}C]Glutamine and its reference standards as potential metabolic imaging agents for tumours (with Prof. Richard Marais, Prof. Kaye Williams and Dr. Adam McMahon; Funded by CRUK). (2) Design and synthesis of a novel series of radiolabelled spin trap molecules and their stable analogues as candidate tracers for imaging immobilised free radicals generated during the beam-energy deposition in tumour radiotherapy (With Prof. Kaye Williams, Dr. Adam McMahon and Prof Alan Jackson; Funded by CRUK and EPSRC). (3) Development of new [^{18}F]labelling strategies of VCAM-1 nanobodies for vascular activation in dementia for Positron Emission Tomography (PET) research (With Dr. Christian Prenant and Prof. Geoff Parker; Funded by EPSRC).

01/01/2014 – 31/12/2015: Postdoctoral Research Associate, WMIC, Manchester Pharmacy School and School of Materials, University of Manchester: (1) Development of new labelling strategies directed towards the synthesis of radiolabelled compounds such as oligopeptides, biopolymers and small molecule tracers for oncology for Positron Emission Tomography (PET) research. (With Dr. Adam McMahon, Prof. Kaye Williams and Dr. Alberto Saiani; Funded by EPSRC). (2) GMP development of [^{11}C]temozolomide for clinical use through radiosynthesis of [^{11}C]Temozolamide and its metabolites for PET imaging for brain tumour. (With Dr. Adam McMahon, Prof. Kaye Williams and Prof. Alan Jackson. Funded by CRUK and EPSRC). (3) Accelerating the early phase development of a new therapeutic for the treatment of small cell Lung cancer (SCLC) (with Prof. Anne White, Dr. Gavin Brown, Prof. Kaye Williams and Dr. Harmesh Aojula; Funded by MRC/UoM CIC scheme).

09/11/2012 – 31/12/2013: Postdoctoral Research Associate, WMIC and Manchester Pharmacy School, University of Manchester; (1) Radiosynthesis of spin traps and spin scavengers; a PET imaging agent to monitor beam-energy deposition in tumour radiotherapy. (A UMIP/UoM PoP project grant awarded to Prof. Kaye Williams and Dr. Adam McMahon); (2) Alkylation of indole ring of tryptophan improves the efficacy of antagonist G analogue for Small Cell Lung Cancer (SCLC). (A J&J/UoM PoP project grant awarded to Dr. Gavin Brown, Prof. Kaye Williams and Dr. Harmesh Aojula; patent and publication pending).

09/11/2009 – 08/11/2012: Postdoctoral Research Associate, WMIC and Manchester Pharmacy School, University of Manchester. (1) A caspase-3 'death-switch' in colorectal cancer cells for induced and synchronous tumour apoptosis *in vitro* and *in vivo* facilitates the development of minimally invasive cell death biomarkers for Positron Emission Tomography (PET) research. (With Dr. Adam McMahon, Prof. Kaye Williams, Prof. Anthony Whetton, Dr. Gavin Brown and Prof. Caroline Dive); Funded by CRUK). (2) Development of new labelling strategies directed towards the synthesis of radiolabelled compounds such as oligopeptides, biopolymers and small molecule tracers for oncology for Positron Emission Tomography (PET) research. (With Dr. Adam McMahon, Prof. Kaye Williams and Dr. Gavin Brown; Funded by University of Manchester and GE Healthcare). (3) Inhibition of quorum sensing and biofilm formation in *Vibrio harveyi* by 4-Fluoro-DPD; a novel potent inhibitor of AI-2 signalling. (With Dr. John Gardiner, Dr. Andrew McBain, Dr. Sally Freeman and Dr. Gavin Brown; Funded by University of Manchester).

28/01/2001 – 31/12/2004: Research Scientist, involved in process optimization, planning and executing multistep organic synthesis in R&D Centre of Shasun Pharmaceuticals Limited (**ISO 9001:2000**), Chennai (Madras), INDIA. Shasun is a leading pharmaceutical company involved in synthesis of Active Pharmaceutical Ingredients (API's) and custom synthesis, with research and manufacturing facilities across India and UK (www.shasun.com).

PROJECTS: Worked on outsourcing projects for the following companies:

- **Eli Lilly (2yrs)** - Synthesised chiral aminoacid derivatives and Olanzapine.
- **Glaxo SmithKline (10 months)** – Synthesised sulfonamide derivatives.
- **Novartis (9 months) –** Synthesised polyheterocyclic derivatives.
- **Eastman Kodak (3 months) –** Synthesised Acrylate 30D copolymer for micro encapsulation.
- Worked on the impurity profile of drugs such as ranitidine, nizatidine and naproxen. Shasun is the largest manufacturer of the above mentioned drugs and ibuprofen globally. Some of the side products have been subjected to toxicological evaluation by the FDA (USA).

01/01/1999 – 13/01/2001: Worked as a Junior Research Fellow in the Swamy Vivekananda College of Pharmacy, Salem, Tamil Nadu, India.
Project: Isolation and pharmacological evaluation of bioflavanoids from tropical plants.

26/101996 – 04/09/1998 (PART TIME): Worked as an Analytical Chemist in Sayee Chemicals, Erode, Tamil Nadu, India.

PUBLICATIONS:

1 **Manikandan Kadirvel**, Déborah Cardoso, Sally Freeman, Adam McMahon and Gavin D Brown; Radioynthesis and reactivity of N[^{11}C]methyl-carbamoylimidazoles: A water stable methylisocyante (MIC) substitute, *Medicinal Chemistry Communication*, (asked for revision from the Editorial office)

2 Alex Baldwin, Halah Hammadi, Carl Schwalbe, **Manikandan Kadirvel**, Panichakorn Jaiyong, Sally Freeman, David Brough et. al., New boron based inhibitors of the NLRP3 inflammasome" Cell Chemical Biology, **2017** (Accepted Manuscript)

3 Shaun Offerman*, **Manikandan Kadirvel***, Osama Abusura, Jennifer Byrant, Brian Tefler, Ann White, Kaye Williams, Gavin Brown and Harmesh Aojula; N-tert-Prenylation of indole ring improves the cytotoxicity of a short antagonist G analogue against Small Cell Lung Cancer. (Manuscript is accepted for the *Medicinal Chemistry Communication*, **2017**, 8, 551-558; * equal contribution.

4 Osama Abusura, Shaun Offerman, **Manikandan Kadirvel**, Gavin Brown and Harmesh Aojula; N-alkylation of indole ring improves the cytotoxicity against tumour cell lines. (Manuscript is being prepared for the ACS Journal of Medicinal Chemistry and currently under revision from our partners)

5 Michael Green, Jonathan Lowe, **Manikandan Kadirvel**, Adam McMahon, Nigel Westwood, Sue Chua and Gavin Brown; The radiosynthesis of meta-[^{124}I]iodobenzylguanidine (**m-[^{124}I]IBG**) for PET imaging of metastatic neuroblastoma, *Journal of Radioanalytical and Nuclear Chemistry*, **2017**, 311, 727-732.

6 Olivia Morris, Jamil Gregory, **Manikandan Kadirvel**, Fiona Henderson, Annelene Blykers,Adam Mcmahon,Christian Prenant. Development & Automation of a novel [18F]F prosthetic group, 2-[18F]-fluoro-3-pyridinecarboxaldehyde, and its application to an amino(oxy)-functionalised Aβ peptide. *Applied Radiation and Isotope*. **2016**, 116, 120-127.

7 Soraya Alnabulsi, Elham Santina, Ilaria Russo, Buthaina Hussein, **Manikandan Kadirvel,** Amy Chadwick, Elena Bichenkova, Richard Bryce, Karen Nolan, Constantinos Demonacos, Ian Stratford and Sally Freeman; Asymmetric furan-amidines as novel leads for the treatment of cancer and malaria, *European Journal of Medicinal Chemistry*, **2016,** 111, 33-45.

8 **Manikandan Kadirvel**, Michael Fairclough, Christopher Cawthorne, Emily J Rowling, Muhammad Babur, Adam McMahon, Paul Birkket**,** Alison Smigova, Sally Freeman, Kaye J Williams and Gavin Brown; Detection of apoptosis by PET/CT with diethylester of **[^{18}F]ML-10** and fluorescence imaging with a dansyl analogue, *Bioorganic and Medicinal Chemistry*, 2014, 22, 341-349.

9 **Manikandan Kadirvel**, Fariba Fanimarvasti, Sarah Forbes, Andrew McBain, John Gardiner, Gavin Brown and Sally Freeman; Inhibition of quorum sensing and biofilm formation in *Vibrio harveyi* by 4-Fluoro-DPD; a novel potent inhibitor of AI-2 signalling, ***Chemical Communications***, **2014**, 50(39), 5000-5002.

10 Ros Krašovec, Roman Belavkin, John Aston, Elizabeth Aston, **Manikandan Kadirvel**, Sarah Forbes, Christopher Knight; Mutation rate plasticity dependent on *luxS*-mediated quorum-sensing in *Escherichia coli, **Nature Communications***, **2014**, 5, 3742.

11 Ros Krašovec, Roman Belavkin, John Aston, Elizabeth Aston, **Manikandan Kadirvel**, Sarah Forbes, Christopher Knight; Where antibiotic resistance mutations meet quorum-sensing*, Microbial Cell*, **2014**, 1(7), 250-252. Micro review has written on invitation from the editor.

12 Olivia Morris, Herve Boutin, Adam McMahon, Stuart Allan, **Manikandan Kadirvel**, and Christian Prenant. Radiolabelling of an anti-amyloid peptide with 6-(2-[^{18}F]Fluoroethoxy)-2-cyanobenzothiazole. *European Journal of Nuclear Medicine and Molecular Imaging*, **2014**, 41(2), S199.

13 Kathryn L. Simpson, Christopher Cawthorne, Cong Zhou, Cassandra L. Hodgkinson, Michael J. Walker, Francesca Trapani, **Manikandan Kadirvel**, Gavin Brown, Martin J. Dawson, Marion MacFarlane, Kaye J. Williams, Anthony D. Whetton, **Caroline Dive**. A caspase-3 'death-switch' in colorectal cancer cells for induced and synchronous tumor apoptosis in vitro and in vivo facilitates the development of minimally invasive cell death biomarkers. ***Cell Death and Disease***, 2013, 4, e613.

14 **Manikandan Kadirvel**, Amna Abudulal Saleem, Ramkumar Rajendran, Abdul Gbaj, Constantinos Demonacos and Sally Freeman. *myo*-Inositol esters of indomethacin as COX-2 inhibitors. *Carbohydrate Research*, **2012**, 355, 13-18.

15 **Manikandan Kadirvel**, Nicholas J. W. Rattray, Ramkumar Rajendran, Waleed A Zalloum, Abdul Gbaj, Constantinos Demonacos, Elena V. Bichenkova and Sally Freeman. Bioreductive molecular probe: Fluorescence signalling upon reduction of an azo group. *New Journal of Chemistry,* **2011**, 35(3), 701-708.

16 **Manikandan Kadirvel**, William T Stimpson, Souad Moumene-Afifi, Biljana Arsic, Nicola Glynn, Nigel Halliday, Paul Williams, Peter Gilbert, Andrew J McBain, Sally Freeman, John M Gardiner; Synthesis and bioluminescence-inducing properties of autoinducer (*S*)-4,5-dihydroxypentane-2,3-dione and its enantiomer. ***Bioorganic & Medicinal Chemistry Letters****,* **2010**, 20(8), 2625-2628.

17 Babu Ganesan, Biljana Arsic, **Manikandan Kadirvel**, Jill Barber, Sankar Sundaram, Mandali Venkateswara Rao; Chemical constituents of *Embelia basaal* (ROEM. & SCHULT.) DC. *Journal of Pharmacy Research*, **2009**, 2(10), 1575-1578.

18 **Manikandan Kadirvel**, Biljana Arsic, Sally Freeman and Elena V. Bichenkova; Exciplex and excimer molecular probes: detection of conformational flip in a *myo*-inositol chair, *Organic and Biomolecular Chemistry,* **2008***,* 6(6), 1966-1972.

19 **Manikandan Kadirvel**, Abdul Gbaj, David Mansell, Steven M. Miles, Biljana Arsic, Elena V. Bichenkova, and Sally Freeman, Conformational Probe: Static quenching is reduced upon upon acid triggered ring flip of a *myo*-inositol derivative derivative, *Tetrahedron,* **2008***,* 64(23), 5598-5603.

20 **Manikandan Kadirvel**, Elena V. Bichenkova, Antony D'Emanuele and Sally Freeman; Locked Energy of Axial to Equatorial Transformation Monitored by Exciplex and Excimer Fluorescence, *Chemistry Letters,* **2006***,* 35(8), 868-869.

CONFERENCES (selected)**:**

1. Presented talk titled “Radiolabelling stragies of VCAM-1 nanobodies”. Presented at Quantification of vascular and neuronal pathology in dementia using PET and MRI Clinical and Scientific Advisory Meeting (22 Oct 2015), University of Manchester. UK.
2. Presented poster titled “A PET imaging agent to monitor beam-energy deposition in tumour radiotherapy”. Presented at Summer school workshop (21-24th Sep 2015), CRUK & EPSRC Cancer Imaging Centre in Cambridge and Manchester. Churchill College, University of Cambridge, UK.
3. Abstract titled “Inositol based fluorescent probes” COST ACTION ANGIOKEM, CM0602, Inhibitors of angiogenesis: Design, Synthesis and biological exploitation (16-18th October 2009), Certosa di Pontignano, Sienna, Italy.
4. Presented Poster titled “*myo*-Inositol-indomethacin esters, as potential prodrugs for COX-2 inhibition” in 60th Indian Pharmaceutical Congress (12-14th December 2008), New Delhi, India.
5. Presented talk titled “*myo*-Inositol based fluorescent probes” School of Pharmacy and Pharmaceutical Sciences (4 February 2007), University of Manchester, UK.
6. Presented talk titled “Inositol based Fluorescent Probes” at Royal Society of Chemistry (RSC) Chemical Biology Workshop “Carbohydrates at the Chemistry-Biology Interface” School of Biological Sciences (20-21st April 2006), University of Liverpool. UK
7. Presented Poster titled “Locked Energy of Axial to Equatorial Transformation Monitored by Exciplex and Excimer Fluorescence”at the Royal Society of Chemistry (RSC) “Frontiers in Chemical Biology: Single Molecules conference” an International conference held at Churchill College (26-29th March 2006), University of Cambridge, UK.
8. Presented Poster titled “Design and development of Anti-Cancer drugs” at the PRISM (Northwest) conference held at School of Biological Sciences (7th July 2005), University of Central Lancashire**,** Preston, UK.
9. Attended Medicinal Chemistry symposium organized by Royal Society of Chemistry (RSC) “Rational drug design” (18th April 2005), University of Hertfordshire, UK.

Grants held as PI or named co-applicant:

1. Recipient of JCP young researcher award, July 2016, India.
2. Awarded CRUK travel fund to work on "PET Imaging of a Substance P Antagonist G analogue (SPG) on Small Cell Lung Cancer (SCLC) using [^{68}Ga]NOTA-bombesin" at John Hopkins University, Baltimore, USA for 3 months (Oct-Dec 2016) (Awarded: £9,800).
3. Research co-applicant on a MRC/UoM CIC project grant awarded to Prof. Anne White, Dr. Gavin Brown, Prof. Kaye Williams and Dr. Harmesh Aojula (July 2014) (£79,604).
4. Research co-applicant on a UMIP/UoM PoP project grant awarded to Prof. Kaye Williams and Dr. Adam McMahon (Jan 2013) (£57,000).
5. Research co-applicant on a J&J/UoM PoP project grant awarded to Dr. Gavin Brown, Prof. Kaye Williams and Dr. Harmesh Aojula (Nov 2012) (£65,000).
6. Awarded EU conference travel fund (COST) to attend and present at the COST ACTION ANGIOKEM, CM0602, Inhibitors of angiogenesis: Design, Synthesis and biological exploitation (16-18th October 2009), Favignana, Italy. COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level (amount £2000, includes travel, accommodation and subsistence).

7. Awarded PGR conference travel fund (University of Manchester) to attend and present at the 60th Indian Pharmaceutical Congress (12-14th December 2008), New Delhi, India (amount £400).

Other evidence of Academic Excellence:

1. We have discovered that microbes living at lower densities are more likely to mutate, resulting in higher rates of antibiotic resistance. Eventually this work might lead to interventions to control mutation rates, for instance to minimise the evolution of antibiotic resistance, allowing antibiotics to work better (**Nature Communications, 2014**). The Wellcome Trust publicised the importance of our work and how it could lead to the development of novel antibiotics is urgently needed to overcome **global drug resistance**.
   http://www.wellcome.ac.uk/News/Media-office/Press-releases/2014/WTP056332.htm

2. We reported that the measurement of cell death could help doctors monitor new anticancer therapies. We have devised a new way to manufacture the radiotracer, and an alternate form, that could potentially improve the quality of PET images (**Cell Death and Disease, 2013** and **Bioorganic and Medicinal Chemistry, 2014**). In a way to engage the scientific community and students, the University of Manchester highlighted the importance of the work in its monthly news letter.
   http://www.manchester.ac.uk/discover/news/article/?id=11956

3. A page of graduate profile was published in the postgraduate prospectus (2011 entry) of the University of Manchester for the excellent outcome of my research as an overseas student.
   http://viewer.zmags.com/publication/15ef4866#/15ef4866/12

4. Presented talk titled “myo-Inositol based fluorescent molecular probes” in AstraZeneca Medicinal Chemistry workshop (22-24th October 2008), AstraZeneca, Alderley Park, Cheshire, UK. One of the 28 chemistry graduates across the UK selected by the **AstraZeneca**.

5. Awarded **Overseas Research Studentship** (ORS) for 3 years (2006 – 2009) by the University of Manchester, UK.

6. Awarded **University Research Studentship** (URS) for 3 years (2006 – 2009) by the Faculty of Medical and Human Sciences, University of Manchester, UK.

7. Qualified **Graduate Aptitude Test in Engineering** (**GATE**) five times for 1998, 1999, 2000, 2001 and 2003 with the percentile scores of 76, 82, 95, 85 and 84, respectively. It is a merited exam jointly organized by the Ministry of Human Resources of India and the Indian Institute of Technology (IIT).

8. An award of **excellence** from the Dr. M.G.R Medical University, Madras for a dissertation in October 1998.

Workshop and training (selected)**:**

- Trained to use TRIASIS - ALL In One platform an automated synthesiser to produce and formulate 4- [^{18}F]fluoroglutamine([^{18}F]F-Gln) for preclinical use at the Penn Nuclear Medicine Centre, University of Pennsylvania, Philadelphia, US under the guidance of Prof. Robert Mach (5-6th Dec 2016).

- Summer School workshop (21-24th Sep 2015), CRUK & EPSRC Cancer Imaging Centre in Cambridge and Manchester. Churchill College, University of Cambridge.
- Joint IIT-Madras–University of Manchester workshop on "Catalysis" organized by Royal Society of Chemistry (16-17th July 2015), University of Manchester, UK.
- GE Health Care workshop (22-24th Nov 2011): Trained to use ***GE-Fastlab*** platform an automated synthesiser to produce and formulate [^{18}F]fluorodeoxyglucose ([^{18}F]FDG) for clinical use at GE Health Care Ltd, Amersham, London, UK.
- AstraZeneca Medicinal Chemistry workshop (22-24th October 2008), AstraZeneca, Alderley Park, Cheshire, UK.

Teaching and Learning

- I have been teaching Medicinal chemistry and Pharmacy Practice for the Pharmacy undergraduate students.
- I have been training PhD students for more than 8 years day-to-day solving their problems involving chemical synthesis, purification and characterization in the field of Organic and Radiochemistry.

SKILLS / ABILITIES:

Chemistry skills

- Hands on experience of running GE PET trace cyclotron and Von Gahlen synthesis hot cells equipped with comprehensive short lived radioisotope (^{18}F and ^{11}C) delivery system using GE's TRACERlab FX-FN/FX-FE and FASTlab platforms.
- Hands on experience in safe handling of radioisotopes such as [^{18}F], [^{11}C], [^{68}Ga], [^{64}Cu], [^{124}I], [^{177}Lu] and [^{225}Ac].
- Hands on experience of the synthesis of organic chemicals from milligram to kilogram scale, expertise in performing sophisticated experiments and delicate reactions such as oxidations, organometallic reactions, cryogenic cooling reactions (- 70°C), Strecker synthesis of aminoacids, Brown hydroboration, Fridel Craft's reaction, Wittig reaction, chiral separations, high pressure reactions (200psi), hydrogenations, high vacuum distillations (0.5m.m Hg), flash column chromatography. Excellent track record on process development of various projects during scale-up in pilot plant and industry.
- Hands on experience of running **FT-NMR, HPLC, GC, UV, Fluorescence, IR** and **MASS** (**MALDI, ESI, APCI, HRMS**) spectrometers. Good working knowledge about documentation, process validation, calibration of instruments, time management and understanding of GLP.

Leadership and Coordination

- Supervised a team in R&D of the pharmaceutical industry for 4 years.
- Supervised 24 pharmacy graduate students during their dissertation.
- Working in a team with the PhD's of Medicinal chemistry and Radiochemistry labs.

Knowledge and Technology Transfer

- GMP development of [^{11}C]temozolomide for clinical use through radiosynthesis of [^{11}C]Temozolamide and its metabolites for brain tumour.
- I have developed a new automated manufacturing process for a apoptotic biomarker, [^{18}F]ML-10 for preclinical use.
- I have been maintaining working relation with my Pharma R&D Centre in India.
- I have been working with two potential networking groups for the biomarker and dementia research such as the CRUK and EPSRC Cancer Imaging Centre at Cambridge & Manchester and Dementia at Manchester.

- Established a working relationship with the Department of Radiology of Johns Hopkins University and University of Pennsylvania, USA.
- Principal investigator of the research travel fund from CRUK and EU (COST).
- Research co-applicant on three successful PoP grant schemes such as MRC/UoM, UMIP/UoM and J&J.

Communication (Public Engagement)

- I have been involving in the public engagement activities by conducting seminars on basic science and methodology in various schools.
- Served as a safety instructor of R&D in fire fighting measures and usage of Personal Protective Equipments (PPE) in hazardous environment.
- I am a passionate cricketer use my free time to raise fund for the cancer charity (Leukaemia & Lymphoma Research) by umpiring cricket matches around Greater Manchester. (http://www.justgiving.com/Manikandan-Kadirvel)

REFERENCES:

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   Phone: (work) +44-161-275 0040; Fax: +44-161-275 0003
   Email: alan.jackson@manchester.ac.uk

2. Dr. Adam McMahon
   Director of Radiosynthetic Chemistry for PET Research
   Wolfson Molecualr Imaging Centre
   27 Palantine Road, The University of Manchester, Manchester. M20 3LJ. UK
   Phone: (work) +44-161-275 0026; Fax: +44-161-275 0003
   Email: adam.mcmahon@manchester.ac.uk

3. Prof Geoff JM Parker
   QBI Lab, Centre for Imaging Sciences
   G535,Stopford Building, Oxford Road
   The University of Manchester, Manchester. M13 9PT. UK
   Phone: (work) +44-161-275 5731
   Email : geoff.parker@manchester.ac.uk

4. Prof. Kaye Williams
   Group Leader, Hypoxia and Therapeutics
   3rd floor,Stopford building, Oxford Road
   Division of Pharmacy and Optometry
   The University of Manchester, Manchester. M13 9PT. UK
   Phone: (work) +44-161-275 2428
   Email: kaye.williams@manchester.ac.uk

5. Prof. K.K.Balasubramanian (former employer)
   Emiretus Professor of Chemistry, Indian Institute of Technology (**IITM**), Madras
   Former Executive Director, R&D Centre, Shasun Pharmaceuticals Limited
   Sardar Patel Road, Adyar, Chennai. 600 036, India
   Phone: +919444910297; Email: kkbalu@hotmail.com