

**P. DURAIPPANDI**

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**Objective:**

To strive for excellence in the area of science with fresh challenges that would serve for social welfare and uplifting of the common man.

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**Education:**

- **Assistant Professor**, (March 2018 – till date)  
Department of Chemistry,  
Central University of Karnataka  
Kalaburagi, Karnataka, India.
  
  - **Post doctoral Research Associate**, (July 2014 – March 2018)  
Department of Pathology and Bosch Institute  
The University of Sydney. Sydney, Australia.
  
  - **Post doctorate**, (August 2012 – June 2014)  
Department of Inorganic and Physical Chemistry  
Indian Institute of Science (IISc), Bangalore, India.
  
  - **Ph.D. in Chemistry** (August 2006 – July 2012)  
Department of Inorganic and Physical Chemistry  
Indian Institute of Science (IISc), Bangalore, India.  
**Dissertation Title:** *“Targeting Cancer Cells and Live Cell imaging Using Bis(thiosemicarbazone) Complexes of Copper and Zinc”*  
**Research Supervisor:** Prof. A. G. Samuelson
  
  - **M.Sc. (Chemistry)**, First class (July 2004 – April 2006)  
The American College, Madurai, India.
  
  - **B.Sc. Special Chemistry**, First class (July 2001 – April 2004)  
The American College, Madurai, India
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**Research awards & fellowships**

- **Earlier carrier Research Grant** for young researchers awarded by The University of Sydney in 2014 (\$ 30,000).

- **Senior Research Fellowship** (SRF) awarded by Council of Scientific and Industrial Research (CSIR), India (August 2008 – July 2011).
  - **Junior Research Fellowship** (JRF) awarded by CSIR, India (August 2006 – July 2008), one among the top 20% of the students qualified in CSIR-JRF and appeared for **Shyama Prasad Mukherjee** (SPM) Fellowship test-2006 in chemical science at the national level.
  - Awarded **Graduate Aptitude Test in Engineering** (GATE) in 2006.
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#### Research experience:

- ✓ Expert in synthesizing and characterizing organic compounds, organometallic complexes and their conjugates with nano-carriers such as carbon nanotubes, PEG and metal nanoparticles.
  - ✓ Cellular imaging with metal complexes and imaging intracellular metal ions.
  - ✓ Mechanistic studies with cancer cells.
  - ✓ DNA and protein/peptide interaction studies.
  - ✓ Strong background in cancer therapy.
  - ✓ Good knowledge in Alzheimer's therapy.
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#### Experimental skills:

- ✓ Handling double manifold Schlenk line.
- ✓ Experience in synthesizing organic ligands and their metal complexes, gold nanoparticles, PEG and MWCNT conjugated drugs in conjunction with targeting molecules like folic acid and biotin (to target cancer).
- ✓ Cell culture and cell-based assays.
- ✓ Western blots.
- ✓ Cellular experiments with radio-labeled  $^{59}\text{Fe}$  and  $^{125}\text{I}$ .
- ✓ Strong knowledge and research experience in cancer therapy.
- ✓ Imaging live cells and intracellular metal ions.
- ✓ DNA interaction studies (DNA -binding, -viscosity, -melting and -cleavage studies).
- ✓ Peptide interaction studies (Amyloid  $\beta$ , acetylcholinesterase, ubiquitin, Topoisomerase and transferrin).
- ✓ Known to interpret the data from SEM, TGA, AFM and animal (mice) experiments.

#### Instruments known to handle:

- ❖ Single crystal X-ray diffractometer (Bruker APEX IV)
- ❖ Nuclear magnetic resonance spectrometer (Bruker 400MHz)
- ❖ Mass spectrometry (Agilent, 6538 High accurate- Q-TOF LC/MS )
- ❖ Confocal fluorescence microscope
- ❖ Viscometer
- ❖ UV-visible spectrophotometer
- ❖ FT-IR spectrometer
- ❖ Cyclic voltammetry
- ❖ HPLC
- ❖ Gel electrophoresis (Agarose, PAGE and western bolts)

- ❖ Micro plate readers (Molecular device (M5<sup>e</sup>), Wallac VICTOR and FLUOstar Omega)
- ❖ Fluorescence spectrometer
- ❖ Raman spectrometer
- ❖ Gamma counter

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**Teamwork skills:**

- Secretary of “AL(L) chemist club” in the Department of Inorganic and Physical Chemistry in 2008–2009.
- Elected as Treasurer, CUK Teachers Association (Since September 2020).
- Conducted a Webinar on Modern Trends in Chemistry and Biology at CUK, August 2020

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**List of Publications - Papers in Refereed Journals**

1. Wu, Z.; **Palanimuthu, D.**; Braidy, N.; Salikin, N. H.; Egan, S.; Huang, M. L. H.; Richardson, D. R.  
*Br. J. Pharmacol.* **2020**, *177*, 1967-1987 (*Impact factor: 7.7, citations: 2*)  
Novel multifunctional iron chelators of the aroyl nicotinoyl hydrazone class that markedly enhance cellular NAD<sup>+</sup>/NADH ratios.
2. Anjum, R.; **Palanimuthu, D.**; Kalinowski, D. S.; Lewis, W.; Park, K. C.; Kovacevic, Z.; Khan, I. U.; Richardson, D. R.  
Synthesis, characterization, and in vitro anticancer activity of copper and zinc bis(thiosemicarbazone) complexes  
*Inorg. Chem.* **2019**, *58*, 13709-13723 (*Impact factor: 4.8, citations: 27*)
3. **Palanimuthu, D.**; Wu, Z.; Jansson, P.J.; Naidy, B.; Bernhardt, P. V.; Richardson, D. R.; Kalinowski D.  
*Dalton Trans.* **2018**, *47*, 7190–7205. (*Impact factor: 4.2, citations: 16*)  
Novel chelators based on adamantane-derived semicarbazones and hydrazones that target multiple hallmarks of Alzheimer’s disease.
4. **Palanimuthu, D.**; Poon, R.; Sahni, S. Anjum, R.; Bernhardt, P. V.; Kalinowski D.; Richardson, D. R.  
*Eur. J. Med. Chem.* **2017**, *139*, 612–632. (*Impact factor: 5.6, citations: 50*)  
A novel class of thiosemicarbazones show multi-functional activity for the treatment of Alzheimer’s disease.
5. Pramanik, A. K.; Uzzaman, S.; **Palanimuthu, D.**; Somasundaram, K.; Samuelson, A. G.  
*Bioconjugate Chem.* **2016**, *27*, 2874–2885. (*Impact factor: 4.0, citations: 26*)  
Biotin decorated gold nanoparticles for targeted delivery of a smartly linked anticancer active copper complex: In vitro and in vivo studies.

6. Stacy, A. E.; **Palanimuthu, D.**; Bernhardt, P.V.; Kalinowski, D. S.; Jansson, P. J.; Richardson, D.R.  
*J. Med. Chem.* **2016**, *59*, 8601–8620. (*Impact factor: 6.2, citations: 61*)  
Structure-activity relationships of di-2-pyridylketone, 2-benzoylpyridine and 2-acetylpyridine thiosemicarbazones for overcoming Pgp-mediated drug resistance.
7. Park, K. C.; Fouani, L.; Jansson, P. J.; Wooi, D.; Sahni, S.; Lane, D. J. R.; **Palanimuthu, D.**; Lok, H. C.; Kovacevic, Z.; Huang, M. L. H.; Kalinowski, D. S.; Richardson, D. R.  
*Metallomics* **2016**, *8*, 874–886. (*Impact factor: 3.8, citations: 69*)  
Copper and conquer: copper complexes of di-2-pyridylketone thiosemicarbazones as novel anti-cancer therapeutics.
8. Stacy, A. E.; **Palanimuthu, D.**; Bernhardt, P.V.; Kalinowski, D. S.; Jansson, P. J.; Richardson, D.R.  
*J. Med. Chem.* **2016**, *59*, 4965–4984. (*Impact factor: 6.2, citations: 98*)  
Zinc(II) thiosemicarbazone complexes are localized to the lysosomal compartment where they transmetallate with copper ions to induce cytotoxicity.
9. Sahni, S.; Krishan, S.; **Palanimuthu, D.**; Richardson D. R.  
*Expert Opin. Therap. Patents.* **2015**, *25*, 367–372. (*Impact factor: 5.6, citations: 1*)  
The use of iron chelators in biocidal compositions: evaluation of patent, WO2014059417A1.
10. **Palanimuthu, D.**; Samuelson, A. G.  
*Inorg. Chim. Acta* **2013**, *408*, 152–161. (*Impact factor: 2.3, citations: 33*)  
Binuclear zinc bis(thiosemicarbazone) complexes: Synthesis, in vitro anticancer activity, cellular uptake and DNA interaction study.
11. **Palanimuthu, D.**; Shinde, S. V.; Dayal, D.; Somasundaram, K.; Samuelson, A. G.  
*Eur. J. Inorg. Chem.* **2013**, 3542–3549. (*Impact factor: 2.5, citations: 5*)  
Imaging intracellular zinc by using a glyoxal-bis(4-methyl-4-phenyl-3-thiosemicarbazone) ligand.
12. **Palanimuthu, D.**; Shinde, S. V.; Somasundaram, K.; Samuelson, A. G.  
*J. Med. Chem.* **2013**, *56*, 722–734. (*Impact factor: 6.2, citations: 206*)  
In vitro and in vivo anticancer activity of copper bis(thiosemicarbazone) complexes.
13. Dayal, D.;\* **Palanimuthu, D.**;\* Shinde, S. V.; Somasundaram, K.; Samuelson, A. G. *J. Biol. Inorg. Chem.* **2011**, *16*, 621–632. (*Impact factor: 3.2, citations: 37*) A novel zinc bis(thiosemicarbazone) complex for live cell imaging.  
\* Contributed equally.

**List of Publications - Patents**

1. Richardson, D. R.; Kalinowski D.; **Palanimuthu, D.**  
*WO Patent WO/2017/214680*  
Adamantane compounds.
2. Richardson, D. R.; Kalinowski D.; **Palanimuthu, D.**  
*WO Patent WO/2017/219086*  
Anti-ageing compounds.
3. Richardson, D. R.; Kalinowski D.; **Palanimuthu, D.**; Poon, R.  
*WO Patent WO/2017/219087*  
New thiosemicarbazone compounds and analogues thereof.

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**Lectures/seminars delivered**

- Delivered a talk on *Novel Iron Chelators for the treatment of Alzheimer's disease* at HRDC, University of Hyderabad, Hyderabad on 21<sup>st</sup> November 2020.
- Delivered a lecture on “*Novel copper and Zinc thiosemicarbazone complexes target cancer cells by overcoming multi-drug resistance*” in the International conference on functional materials. Thiagarajar College, Madurai on 7-8 September, 2017.
- Delivered a seminar on “*Nitrogen fixation*” in the Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore on October, 2007.
- Delivered a seminar on “*Zinc homeostasis*” in the Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore on March, 2009.
- Delivered a lecture on “*Studies on imaging zinc in cancer cells using bis(thiosemicarbazone) ligands*” in RTC-IV, The American College, Madurai, February, 2010.

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**Posters presented in the international/national conferences/symposia**

1. *Novel multi-functional Iron chelators enhance cellular NAD<sup>+</sup>/NADH ratios.* **Duraippandi P**, Wu Z, Braidy, N, Salikin, NH, Egan S, Huang MLH, Richardson D. R., CRSI 26th National symposium in chemistry, Feb 7-9, 2020, VIT Vellore, India.
2. *Unusual anticancer activity of binuclear zinc bis(thiosemicarbazone) complexes.* **Modern Trends in Inorganic Chemistry (MTIC-XV)**, December 13–16, 2013, Indian Institute of Technology-Roorkee, India.

3. *Targeted therapy of cancer with bis(thiosemicarbazone) complexes*. Chemical sciences divisional day (**ACS meeting**), 3<sup>rd</sup> October, 2012, Indian Institute of Science, Bangalore, India.
4. *Bis(thiosemicarbazones): versatile ligands for making zinc based imaging agents and anticancer active copper complexes*. **Metalomics 2011-3<sup>rd</sup> International symposium on metalomics**, June 15–18, 2011, University of Münster, Münster, Germany.
5. *Studies on anticancer active copper bis(thiosemicarbazone) complexes and their mechanism of action*. **13<sup>th</sup> CRSI National symposium on chemistry**, February 4–6, 2011, NISER-KIIT University, Bhubaneswar, India.
6. *Anticancer activity of bis(thiosemicarbazone) ligands and their metal complexes: A comparative study*. **Modern Trends in Inorganic Chemistry (MTIC-XIII)**, December 7–10, 2009, Indian Institute of Science-Bangalore, India.
7. *Cellular distribution of bis(thiosemicarbazone) ligands and their zinc and copper complexes*. **Symposium on Advanced Biological Inorganic Chemistry (SABIC-2009)**, November 4–7, 2009, Tata Institute of Fundamental Research, Mumbai, India.

#### **Conferences/ Winter-Schools attended:**

1. **Winter-School in Bioinorganic Chemistry**, November 17-30, 2007, Indian Institute of Technology Bombay, Mumbai, India.
2. **School on Advanced Biological Inorganic Chemistry**, November 2-5, 2009, Tata Institute of Fundamental Research, Mumbai, India.
3. **10<sup>th</sup> CRSI National Symposium in Chemistry**, February 1-3, 2008, Indian Institute of Science, Bangalore, India.

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#### **Conferences/ Lectures organized**

- 1) A symposium on “Recent Trends in Chemistry” (RTC-III) at The American College, Madurai in 2009 was successfully organized.
- 2) A series of Online seminars on “Modern Trends in chemistry and Biology” arranged during COVID-19 from August to September 2020.

#### **Administrative positions held:**

- 1) Coordinator of Life Science, August 2019 to 27<sup>th</sup> January 2021.
- 2) Co-coordinator of Undergraduate studies (2018 -2020)
- 3) COVID-19 Nodal Officer (August 2019- till date)

#### **Academic responsibilities:**

- 1) BoS Member of Physics and Life Science at CUK from 2020
- 2) Examiner for Chemistry examinations, Gulbarga University.

**Membership:**

- 1) Life member of Chemical Research Society of India (CRSI), India (ID; LM 2477)
- 2) Member, Society for Redox Biology and Medicine (SfRBM), USA

**Teaching Experience:**

I have been teaching both M.Sc Chemistry and B.Sc program for the last 3 Years

**Course taught:** Coordination Chemistry, Organometallic chemistry, Atomic Structure, Solid State Chemistry, Nuclear Chemistry, Bioinorganic Chemistry, Chemical Applications of Group Theory.

**Grants Received**

- **Early career Research Grant (\$ 30,000)** for young researchers awarded by University of Sydney in 2014.
- **BSR Start up Grant (10,00,000)** awarded by UGC in 2019.

**PhD and M.Sc Projects:**

PhD – Ongoing -2; Completed =0

M.Sc – Ongoing -0; Completed =15

**Personal information:**

Gender : Male  
 Date of Birth : 6<sup>th</sup> April 1984  
 Marital Status : Married  
 Permanent Address : Kilanery, Vadivelkarai (Post), Madurai – 625019, India.  
 Languages known : English and Tamil

**References:**

<p><b>Prof. A. G. Samuelson</b>            Professor            Department of Inorganic and Physical Chemistry            Indian Institute of Science            Bangalore 560 012, India.            Phone: +91-80-22932663            E-mail: ashoka@ipc.iisc.ernet.in</p>	<p><b>Prof. K. Somasundaram</b>            Professor            Department of Microbiology and Cell biology            Indian Institute of Science            Bangalore 560 012, India.            Phone: +91-80-22932973            E-mail: skumar@mcbl.iisc.ernet.in</p>
<p><b>Prof. Des R. Richardson</b>            Professor            Director, Molecular Pharmacology and Pathology Program,            Department of Pathology and Bosch Institute,            The University of Sydney, Sydney, 2006            Australia            Ph: + 61-2-9036-6548            Email: d.richardson@med.usyd.edu.au</p>	