

## Sumit Dadhwal

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### Current Position

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Postdoctoral Fellow      Bayer Centre for Dairy Animal Health Pharmaceutical      2019  
Science & Product Innovations, University of Otago

### Education

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Ph.D      University of Otago, New Zealand      2014-2018  
(Medicinal Chemistry)

Master of Pharmacy      Maharishi Markandeshwar University, India      2009-2011  
(Pharmaceutical Chemistry)

Bachelor of Pharmacy      Punjab Technical University, India      2004-2008

### Professional Experience

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Senior Research Fellow      CSIR-Institute of Himalayan Bioresource Technology      2013-2014

Project Assistant      CSIR-Institute of Himalayan Bioresource Technology      2011-2013  
(Palampur, India)

Research Trainee      CSIR-Indian Institute of Integrative Medicine      2010-2011  
(Jammu, India)

Teaching Fellow      Punjab Institute of Paramedical Sciences      2008-2009  
(Mukerian, India)

## Research Experience

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### 1. Doctor of Philosophy

**“Design and synthesis of block copolymer using ATRP polymerization for the development of stimuli-responsive polymersomes.”**

A block copolymer was synthesized and used to develop stimuli-responsive polymersomes and investigated for *in vitro* (cell-free and cell-based assays) and *in vivo* (murine melanoma model) drug delivery.

**“Bioorthogonal triggered responsive dipeptide hydrogels for drug delivery”**

Dipeptide attached with a stimuli-responsive capping moiety was designed and explored for drug delivery. Additionally, a hydrogelator with tetra-fluorine on the capping moiety was investigated to determine the effect of electron-withdrawing fluorine on stimuli-responsive and viscoelastic properties of the hydrogel.

**“Bioorthogonally cross-linked thermoresponsive alginate-pluronic hydrogel for drug delivery applications.”**

Alginate and pluronic were chemically modified and 1,3-dipolar cycloaddition reaction was investigated to cross-link alginate-pluronic hydrogel.

### 2. Senior Research Fellow

Development and applications of heterogeneous nano-catalyst.

### 3. Project Assistant

Isolation, extraction, and purification of natural products.

Microwave-assisted synthesis of biologically active molecules.

### 4. Research Trainee

Iron oxide mediated direct C–H arylation/alkylation at  $\alpha$ -position of cyclic aliphatic ethers.

## Research Skills

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- Polymer synthesis (RAFT, ATRP, ROP, and SET-LRP polymerization)
- Organic synthesis
- Development of formulations (nanoparticles and hydrogels) and their characterization
- High-performance liquid chromatography (HPLC)
- Cell culture
- Animal handling
- Gel permeation chromatography (GPC)
- Transmission electron microscopy (TEM)
- Scanning electron microscope (SEM)
- Rheology
- Texture analyser
- Spray-drying
- Dynamic light scattering (DLS)
- Fourier-transfer infrared spectroscopy (FTIR)
- Nuclear magnetic resonance

## Awards and Fellowships

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Best Postgrad Research Paper Award	Green Cross Health Pharmacy Awards (School of Pharmacy, University of Otago)	2019
Best Poster Award	New Zealand Society of Oncology (NZSO)	2018
Travel Grant	Centre for Translational Cancer Research (University of Otago)	2017
Student Research Award (Electron microscopy)	University of Otago	2015
Doctoral Scholarship	University of Otago	2014

Senior Research Fellowship	Council of Scientific and Industrial Research (Government of India)	2013
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Best Research Paper Award	CSIR-Indian Institute of Integrative Medicine	2011
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### Demonstration Experience

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PHCY256 Laboratory demonstration	University of Otago	2016-2017
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PHCY255 Laboratory demonstration	University of Otago	2016
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PHCY259 Laboratory demonstration	University of Otago	2017
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PHCY343 Laboratory demonstration	University of Otago	2018
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### Publications

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**Sumit Dadhwal**, Jessica M. Fairhall, Shailesh K. Goswami, Sarah Hook and Allan B. Gamble, Alkene-azide 1,3-dipolar cycloaddition as a trigger for ultrashort peptide hydrogel dissolution. (*Chem. Asian J.* 2019, 14, 1143-1150, **Highlighted in Chemistryviews** [https://www.chemistryviews.org/details/ezone/11116326/Click\\_Reaction\\_Dissolves\\_Hydrogel\\_for\\_Drug\\_Release.html](https://www.chemistryviews.org/details/ezone/11116326/Click_Reaction_Dissolves_Hydrogel_for_Drug_Release.html))

**Sumit Dadhwal**, Jessica M. Fairhall, Sarah Hook and Allan B. Gamble, Tetrafluoroaryl azide as a stimuli-responsive and removable N-terminal capping group for diphenylalanine hydrogels (**Submitted to Scientific Reports, Under Review**)

**Sumit Dadhwal**, Keeho Lee, Shailesh K. Goswami, Sarah Hook, and Allan B. Gamble, Bioorthogonal triggered, pH-responsive and hydrogen sulfide triggerable polymersomes for *in vitro* and *in vivo* cancer-targeted drug delivery. (Manuscript in preparation)

Fairhall, J.M.; Murayasu, M.; **Dadhwal, S.**; Hook, S.; and Gamble, A.B. Mechanistic and kinetic investigation of 1,3-dipolar cycloaddition between modified aryl-azide and functionalized *trans*-cyclooctenes and the subsequent release of phenol. (Manuscript in preparation)

Sean D.A. Abel, **Sumit Dadhwal**, Allan B. Gamble, Sarah K. Baird, Honey reduces the metastatic characteristics of prostate cancer cell lines PC3 and DU145 by promoting a loss of adhesion and inhibiting invasion. *PeerJ* **6:e5115**; DOI [10.7717/peerj.5115](https://doi.org/10.7717/peerj.5115)

Arun K. Shil, Sandeep Kumar, C. Bal Reddy, **Sumit Dadhwal**, Vandna Thakur, and Pralay Das, Supported Palladium Nanoparticle-Catalyzed Carboxylation of Aryl Halides, Alkenylsilanes, and Organoboronic Acids Employing Oxalic Acid as the C<sub>1</sub> Source. *Org. Lett.*, **2015**, *17* (21), 5352–5355.

Bashir A. Dar, **Sumit Dadhwal**, Gurkirpal Singh, Pankaj Garg, Pushpa Sharma, Baldev Singh, Vapour Phase Conversion of Glycerol to Acrolein over Supported Copper. *Arab J Sci Eng* (2013) **38:37–40**

Amit Shard, Naina Sharma, Richa Bharti, **Sumit Dadhwal**, Rajesh Kumar, Arun K. Sinha, Tandem Heck/Decarboxylation/Heck Strategy: Protecting-Group-Free Synthesis of Symmetric and Unsymmetric Hydroxylated Stilbenoids. *Angew. Chem. Int. Ed.*, **2012**, *51*, 12250 –12253

Parvinder Pal Singh, Satish Gudup, Srinivas Ambala, Umed Singh, **Sumit Dadhwal**, Baldev Singh, Sanghapal D. Sawant and Ram A. Vishwakarma, Iron oxide mediated direct C–H arylation/alkylation at  $\alpha$ -position of cyclic aliphatic ethers. *Chem. Commun.*, **2011**, *47*, 5852-5854.

Bashir A. Dar, Akshya Sahu, **Sumit Dadhwal**, Aruri H. Prasad, Gurkirpal Singh, Pankaj Garg Pushpa Sharma, Baldev Singh, Supported nano-gold a recyclable catalyst for aerobic oxidation of amines. *Report and Opinion*, **2012**; *4* : (1).

**Sumit Dadhwal**, Pushpa Sharma, Gurkirpal Singh, Pankaj Garg, Sakshi Sharma, DK Sharma, Cyclin dependent kinases (CDK)- A key regulator protein. *International journal of pharmacy & technology (IJPT)*, 2011, 3, 1122-1139.

Pushpa Sharma, Pankaj Garg, **Sumit Dadhwal**, Gurkirpal Singh, D.K.Sharma, Sakshi Sharma, Antimicrobial activity of Butanol extract of Malaxis acuminata. *Journal of Pharmacy Research*, 2011, 4 (8), 2703-2704.

Gurkirpal Singh, Pushpa Sharma, **Sumit Dadhwal**, Pankaj Garg, Sakshi Sharma, Nipun Mahajan, Shruti Rawal, Triazolines-impinging the bioactivities. *International Journal of Current Pharmaceutical Research*, 2011, 3, 105-118.

### Conference Contributions

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Poster Presentation	New Zealand Society of Oncology (NZSO)	2018
Poster Presentation	Queenstown Research Week (Drugs and Devices)	2018
Oral Presentation (Invited speaker)	Gordon Research Seminar- Cancer Nanotechnology (Boston, USA)	2017
Poster Presentation	Gordon Research Conference-Cancer nanotechnology (Boston, USA)	2017
Oral Presentation	Diagnostic Drug Device Discovery (D4)	2016

### Referees

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<b>Dr. Allan Gamble</b>	<b>Prof. Sarah Hook</b>	<b>Dr. Greg Walker</b>
School of Pharmacy	School of Pharmacy	School of Pharmacy
University of Otago	University of Otago	University of Otago
New Zealand	New Zealand	New Zealand
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