**WHY USE IRDYE INFRARED DYES AND BRIGHTSITE PROBES?**

Optical imaging takes place optimally in the near-infrared (NIR) region due to low background. Tissue strongly absorbs and scatters visible light. This limits penetration of excitation light and detection of emitted fluorescence for detection at NIR wavelengths. Tissue absorption is dramatically reduced, and light penetration is improved.

Tissue autofluorescence is significantly reduced in the NIR range, so the desired signals are not obscured. Smaller doses of optical agents can typically be used, and detection of early stages of disease may become possible. Below are examples of pre-clinical applications of IRDye infrared dye optical probes available from LI-COR.

---

**Pre-clinical Applications of IRDye Infrared Dye Optical Probes**

- **Lymph node metastasis in mouse with orthotopic prostate tumor, imaged with IRDye 800CW EGF.**
- **Arthritis imaging with IRDye 800CW 2-DG in DBA Collagen antibody-induced arthritis model.**
- **Lymph node imaging with IRDye 680RD HA, inset image with white light.**
- **Subcutaneous U87 tumor with elevated integrin expression detected on the mouse’s hip, imaged with IRDye 680RD RGD.**
- **Subcutaneous A431 tumor with increased glucose metabolism detected with IRDye 800CW 2-DG.**
- **Tumor vasculature imaged with IRDye 800CW PEG.**
- **Micro-metastasis to kidney (intraoperative imaging).**

---

November 2014

BrightSite™ and Unique IRDye® Probes
Publications List
June 2013 to August 2014, 31 selected and verified from 48 search results

Volume 3
Table of Contents
Biodistribution / Pharmacokinetics ............................................................................. 2
Cancer / Oncology ....................................................................................................... 3
Cardiovascular / Lymphatic Imaging ........................................................................... 5
Inflammation / Immunology ........................................................................................ 5
Materials Science / Nanotechnology ......................................................................... 6
Regenerative Medicine / Tissue Engineering ............................................................. 6

Biodistribution / Pharmacokinetics

Lipa Shah, Florence Gattaccceca, and Mansoor M. Amiji

Accounting for pharmacokinetic differences in dual-tracer receptor density imaging.
K. M. Tichauer, M. Diop, J. T. Elliott, K. S. Samkoe, T. Hasan, K. St. Lawrence, and B. W. Pogue

Tumor targeting of a cell penetrating peptide by fusing with a pH-sensitive histidine-glutamate co-oligopeptide.
Likun Fei, Li-Peng Yap, Peter S. Conti, Wei-Chiang Shen, and Jennica L. Zaro

In vivo fluorescence imaging of IgG1 aggregates after subcutaneous and intravenous injection in mice.
Vasco Filipe, Ivo Que, John F. Carpenter, Clemens Löwik, and Wim Jiskoot

Liposomal encapsulation enhances in vivo near infrared imaging of exposed phosphatidylserine in a mouse glioma model.
Liang Zhang and Dawen Zhao
http://www.mdpi.com/1420-3049/18/12/14613

The Effect of Molecular Weight, PK, and Valency on Tumor Biodistribution and Efficacy of Antibody-Based Drugs.
Ruth Muchekehu, Dingguo Liu, Mark Horn, Lioudmila Campbell, Joselyn Del Rosario, Michael Bacica, Haim Moskowitz, Trina Osothprarop, Anouk Dirksen, Venkata Doppalapudi, Allan Kaspar, Steven R. Pirie-Shepherd, and Julia Coronella
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3799199/
**Liver-targeting of primaquine-(poly-γ-glutamic acid) and its degradation in rat hepatocytes.**

Noboru Tomiya, Juliette G. Jardim, Jennifer Hou, Rebecca Pastrana-Mena, Rhoel R. Dinglasan, and Yuan C. Lee


**Cancer Imaging / Oncology**

**Quantifying metabolic heterogeneity in head and neck tumors in real time: 2-DG uptake is highest in hypoxic tumor regions.**

Erica C. Nakajima, Charles Laymon, Matthew Oborski, Weizhou Hou, Lin Wang, Jennifer R. Grandis, Robert L. Ferris, James M. Mountz, and Bennett Van Houten


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4134191/

**Phosphatidylserine-targeted molecular imaging of tumor vasculature by magnetic resonance imaging.**

Heling Zhou, Jason H. Stafford, Rami Hallac, Liang Zhang, Gang Huang, Ralph P. Mason, Jinming Gao, Philip Thorpe, and Dawen Zhao


**Dual-Modality Image-Guided Surgery of Prostate Cancer with a Radiolabeled Fluorescent Anti-PSMA Monoclonal Antibody.**

Susanne Lütje, Mark Rijpkema, Gerben M. Franssen, Giulio Fracasso, Wijnand Helfrich, Annemarie Eek, Wim J. Oyen, Marco Colombatti, and Otto C. Boerman


**uPAR-targeted optical imaging contrasts as theranostic agents for tumor margin detection.**

Lily Yang, Hari Krishna Sajja, Zehong Cao, Weiping Qian, Laura Bender, Adam I. Marcus, Malgorzata Lipowska, William C. Wood, and Y. Andrew Wang


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3881230/

**Theranostic gold nanoparticles modified for durable systemic circulation effectively and safely enhance the radiation therapy of human sarcoma cells and tumors.**

Daniel Y. Joh, Gary D. Kao, Surya Murty, Melissa Stangl, Lova Sun, Ajlan Al Zaki, Xiangsheng Xu, Stephen M. Hahn, Andrew Tsourkas, and Jay F. Dorsey


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3890707/

**Optical techniques for the intraoperative assessment of nodal status.**

Diederik J. Grootendorst, Wiendelt Steenbergen, Srirang Manohar, and Theo J. M. Ruers


Inhibition of tumor growth by targeted anti-EGFR/IGF-1R nanobullets depends on efficient blocking of cell survival pathways.
Roy van der Meel, Sabrina Oliveira, Isil Altintas, Raimond Heukers, Ebel H. E. Pieters, Paul M. P. van Bergen en Henegouwen, Gert Storm, Wim E. Hennink, Robbert J. Kok, and Raymond M. Schiffelers

Tumor Margin Detection Using Quantitative NIRF Molecular Imaging Targeting EpCAM Validated by Far Red Gene Reporter iRFP.

Multifactorial diagnostic NIR imaging of CCK2R expressing tumors.
Susanne Kossatz, Martin Béhé, Rosalba Mansi, Dieter Saur, Peter Czerney, Werner A. Kaiser, and Ingrid Hilger

Molecular imaging with a fluorescent antibody targeting carbonic anhydrase IX can successfully detect hypoxic ductal carcinoma in situ of the breast.

Bevacizumab-induced normalization of blood vessels in tumors hampers antibody uptake.
http://cancerres.aacrjournals.org/content/73/11/3347.long
**Cardiovascular / Lymphatic Imaging**

Differential transport function of lymphatic vessels in the rat tail model and the long-term effects of Indocyanine Green as assessed with near-infrared imaging.
Michael Weiler and J. Brandon Dixon
[http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3744037/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3744037/)

Use of a PEG-conjugated bright near-infrared dye for functional imaging of rerouting of tumor lymphatic drainage after sentinel lymph node metastasis.
Steven T. Proulx, Paola Luciani, Ailsa Christiansen, Sinem Karaman, Katrin S. Blum, Matthias Rinderknecht, Jean-Christophe Leroux, and Michael Detmar
[http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3646951/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3646951/)

Non-invasive dynamic near-infrared imaging and quantification of vascular leakage in vivo.
Steven T. Proulx, Paola Luciani, Annamari Alitalo, Viviane Mumprecht, Ailsa J. Christiansen, Reto Huggenberger, Jean-Christophe Leroux, and Michael Detmar
[http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3713856/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3713856/)

**Inflammation / Immunology**

Human monoclonal Fab and human plasma antibodies to carbamyl-epitopes cross-react with malondialdehyde-adducts.
Outi Kummu, S. Pauliina Turunen, Piotr Prus, Jaakko Lehtimäki, Marja Veneskoski, Chenguang Wang, and Sohvi Hörkkö

Natural antibodies of newborns recognize oxidative stress-related malondialdehyde acetaldehyde adducts on apoptotic cells and atherosclerotic plaques.
Chenguang Wang, S. Pauliina Turunen, Outi Kummu, Marja Veneskoski, Jaakko Lehtimäki, Antti E. Nissinen, and Sohvi Hörkkö

Murine analogues of etanercept and of F8-IL10 inhibit the progression of collagen-induced arthritis in the mouse.
Fabia Doll, Kathrin Schwager, Teresa Hemmerle, and Dario Neri
[http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3978877/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3978877/)
**Materials Science / Nanotechnology**

**Fluorescence enhancement of molecules inside a gold nanomaterialyoshka.**
Ciceron Ayala-Orozco, Jun G. Liu, Mark W. Knight, Yumin Wang, Jared K. Day, Peter Nordlander, and Naomi J. Halas

**Optimal dye-quencher pairs for the design of an "activatable" nanoprobe for optical imaging.**
Bryan Simard, Boguslaw Tomanek, Frank C. J. M. van Veggelc, and Abednasser Abulrob

The three-dimensional context of a double helix determines the fluorescence of the internucleoside-tethered pair of fluorophores.
Valeri Metelev, Surong Zhang, David Tabatadze, Anand T.N. Kumar, and Alexei Bogdanov, Jr.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3929952/

**Site-specific protein labeling with SNAP-tags.**
Nelson B. Cole

**Regenerative Medicine / Tissue Engineering**

**Validation of a simple and fast method to quantify in vitro mineralization with fluorescent probes used in molecular imaging of bone.**
Martiene J.C. Moester, Monique A.E. Schoeman, Ineke B. Oudshoorn, Mara M. van Beusekom, Isabel M. Mol, Eric L. Kajzel, Clemens W.G.M. Löwik, and Karien E. de Rooij

**Targeting hepatocyte growth factor receptor (Met) positive tumor cells using internalizing nanobody-decorated albumin nanoparticles.**
Raimond Heukers, Isil Altintas, Smiriti Raghoenath, Erica De Zan, Richard Pepermans, Rob C. Roovers, Rob Haselberg, Wim E. Hennink, Raymond M. Schifflers, Robbert J. Kok, and Paul M.P. van Bergen en Henegouwen

**Real-time in vivo imaging of invasive- and biomaterial-associated bacterial infections using fluorescently labelled vancomycin.**