In Vivo imaging reagents

Bioluminescent Reagents and Fluorescent Probes, Dyes, and Labels
INTRODUCTION

More Insightful Research Results

Our comprehensive range of bioluminescent and fluorescent imaging agents provides researchers with the necessary tools to better understand early disease-related biological changes, track disease progression, help guide the drug discovery process, and evaluate efficacy and safety of drug candidates. All of our optical imaging reagents, probes, labels, and dyes have been optimized and validated in a broad range of imaging applications using our industry-leading IVIS® imaging platform.

MMP and cathepsin activity in 4T1 tumors using IVISense™ MMP 680 and IVISense Pan Cathepsin 750

Fluorescence imaging of cathepsin activity in antibody induced arthritis using IVISense Pan Cathepsin 750 probe

Bioluminescence imaging of IVISbrite™ Red F-luc transduced A549 lung tumor cells

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**IVISense™ FLUORESCENT AGENTS**

**Detect, Understand, and Characterize Disease Earlier**

Revvity’s comprehensive suite of validated fluorescent imaging agents, designed for use in your in vivo research, enables unmatched imaging of a broad range of disease-related biomarkers and protease activity. Our IVISense fluorescent probes, dyes, and cell labeling dyes are optimized for use in our IVIS optical in vivo imaging systems, as well as other fluorescence microscopy systems and many in vitro and cell-based systems.

**Activatable In Vivo Imaging Fluorescent Probes**

Activatable agents are optically silent upon injection, but are activated in vivo through cleavage by specific protease biomarkers of disease. The probes are designed to target and read out disease-related molecular activities with high signal-to-noise ratios at the biological target.

The FAST platform represents the next generation of agents from Revvity. Utilizing a novel small molecule design, the FAST agents offer improved specificity, accelerated activation profile, and earlier imaging timepoints.

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#### PROBE | PRODUCT DESCRIPTION | CAT. NUMBER

| IVISense Cat B 680 FAST | Selective imaging of cathepsin B proteinases (Cat B). Optically silent in the inactivated state, becoming highly fluorescent when activated. | NEV11112 |
| IVISense Cat B 750 FAST | | NEV11098 |
| IVISense Cat K 680 FAST | Imaging of cathepsin K (Cat K) activity in oncology applications involving metastasis to the bone as well as a broad range of bone applications, including bone loss, tumor-induced osteolysis, and bone changes following arthritis. | NEV11000 |
| IVISense MMP 645 FAST | Imaging of metalloproteinase (MMP) activity is involved in many disease-related phenomena, including cancer propagation, invasion and metastasis, rheumatoid arthritis, and areas of cardiovascular disease. | NEV10100 |
| IVISense MMP 680 | | NEV10126 |
| IVISense MMP 750 FAST | | NEV10168 |
| IVISense Neutrophil Elastase 680 FAST | Fluorescent neutrophil elastase-activatable agent that is optically silent upon injection and produces a fluorescent signal after cleavage by elastase produced by neutrophil cells. | NEV11169 |
| IVISense Pan Cathepsin 680 (formerly ProSense 680) | Versatile imaging of changes in cathepsin-based protease activity as seen in a number of pathological states and disease-related events, including rheumatoid arthritis, cancer, atherosclerosis, angiogenesis, and cardiovascular disease. | NEV10003 |
| IVISense Pan Cathepsin 750 | FAST version of ProSense, with faster kinetics and a broader imaging window. | NEV10010X |
| IVISense Renin 680 FAST | Imaging of renin-angiotensin pathway associated with hypertension, and kidney and cardiovascular disease. | NEV11079 |
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IVISense™ FLUORESCENT AGENTS

Targeted In Vivo Imaging Fluorescent Probes
Optimized in vivo imaging agents that actively target and bind to specific biomarkers. These probes are designed to target key biology, such as cell surface receptor upregulation or bone turnover, and accumulate directly at the local site with high specificity.

<table>
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<tr>
<th>PROBE</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISense Osteo 680</td>
<td>Optimized imaging of bone turnover through binding of hydroxypatite.</td>
<td>NEV1020EX</td>
</tr>
<tr>
<td>IVISense Osteo 750</td>
<td>Optimized imaging of bone turnover through binding of hydroxypatite.</td>
<td>NEV1053EX</td>
</tr>
<tr>
<td>IVISense Osteo 800</td>
<td>Optimized imaging of bone turnover through binding of hydroxypatite.</td>
<td>NEV11105</td>
</tr>
<tr>
<td>IVISense Tomato Lectin 680</td>
<td>NIR-labeled tomato lectin protein that has high binding affinity for glycoprotein N-acetylglucosamines on the surface of vascular endothelial cells. Use for vascular mapping in vivo.</td>
<td>NEV10080</td>
</tr>
<tr>
<td>IVISense Tomato Lectin 750</td>
<td>NIR-labeled tomato lectin protein that has high binding affinity for glycoprotein N-acetylglucosamines on the surface of vascular endothelial cells. Use for vascular mapping in vivo.</td>
<td>NEV10081</td>
</tr>
</tbody>
</table>

Table: PROBE PRODUCT DESCRIPTION CAT. NUMBER

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<tr>
<th>PROBE</th>
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</thead>
<tbody>
<tr>
<td>IVISense Annexin-V 750</td>
<td>In vivo targeting of membrane-bound phosphatidylserine exposed during the early stages of apoptosis.</td>
<td>NEV11053</td>
</tr>
<tr>
<td>IVISense Bombesin Receptor 680</td>
<td>Target and quantify up-regulation of bombesin receptors (BBR) in vivo associated with tumor proliferation. These receptors are also over-expressed in a variety of cancers.</td>
<td>NEV10090</td>
</tr>
<tr>
<td>IVISense Folate Receptor 680</td>
<td>Highly specific and sensitive in the detection of folate receptor proteins. Can be used to closely monitor and quantitate tumor growth and metabolism.</td>
<td>NEV10040</td>
</tr>
<tr>
<td>IVISense Hypoxia CA IX 680</td>
<td>Detects the tumor cell surface expression of carbonic anhydrase 9 (CA IX) protein, which increases in hypoxic regions within many tumors.</td>
<td>NEV10070</td>
</tr>
<tr>
<td>IVISense Integrin Receptor 645</td>
<td>Targets integrin αvβ3 expressed in oncology, atherosclerosis, and angiogenesis disease models.</td>
<td>NEV10640</td>
</tr>
<tr>
<td>IVISense Integrin Receptor 680</td>
<td>Targets integrin αvβ3 expressed in oncology, atherosclerosis, and angiogenesis disease models.</td>
<td>NEV10645</td>
</tr>
<tr>
<td>IVISense Integrin Receptor 750</td>
<td>Targets integrin αvβ3 expressed in oncology, atherosclerosis, and angiogenesis disease models.</td>
<td>NEV10873</td>
</tr>
</tbody>
</table>

Small molecule labeled with fluorescent dye binds to membrane-bound receptor.
**IVISense™ FLUORESCENT AGENTS**

**Vascular In Vivo Imaging Fluorescent Probes**

Revitty’s vascular and physiological agents are a range of highly fluorescent in vivo imaging molecules designed to remain highly stable and localized in the anatomy for various periods of time to enable imaging of disease physiology, vasculature, vascular permeability, and angiogenesis.

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<tr>
<th>PROBE</th>
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</thead>
<tbody>
<tr>
<td>IVISense Vascular 680</td>
<td>Imaging of vascularity, perfusion, and vascular permeability. Remains localized in vasculature for 0-4 h; accumulates in tumors and arthritic joints at 24 h.</td>
<td>NEV10054EX</td>
</tr>
<tr>
<td>IVISense Vascular 750</td>
<td>Fluorescent nanoparticles for imaging vascularity, perfusion and vascular permeability; long pharmacokinetic profile.</td>
<td>NEV10011EX</td>
</tr>
<tr>
<td>IVISense Vascular NP 680</td>
<td>Fluorescent nanoparticles for imaging vascularity, perfusion, and vascular permeability. Long pharmacokinetic profile.</td>
<td>NEV10149</td>
</tr>
<tr>
<td>IVISense Vascular NP 750</td>
<td>Fluorescent nanoparticles for imaging vascularity, perfusion, and vascular permeability. Long pharmacokinetic profile.</td>
<td>NEV10150</td>
</tr>
<tr>
<td>IVISense Gastrointestinal 750</td>
<td>Imaging to monitor gastric emptying and the impact of various drugs on gastric motility; may also be used as an anatomical marker for the stomach.</td>
<td>NEV11121</td>
</tr>
<tr>
<td>IVISense Acute Vascular 680 (1 mg)</td>
<td>Fluorescent probes that enable imaging and quantitation of acute vascular permeability increase, bladder clearance via intravital ureter imaging, or incorporation into liposomes for drug delivery monitoring.</td>
<td>NEV10117</td>
</tr>
<tr>
<td>IVISense Acute Vascular 680 (5 mg)</td>
<td>Fluorescent probes that enable imaging and quantitation of acute vascular permeability increase, bladder clearance via intravital ureter imaging, or incorporation into liposomes for drug delivery monitoring.</td>
<td>NEV10130</td>
</tr>
<tr>
<td>IVISense Acute Vascular 750 (1 mg)</td>
<td>Fluorescent probes that enable imaging and quantitation of acute vascular permeability increase, bladder clearance via intravital ureter imaging, or incorporation into liposomes for drug delivery monitoring.</td>
<td>NEV10116</td>
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<tr>
<td>IVISense Acute Vascular 750 (5 mg)</td>
<td>Fluorescent probes that enable imaging and quantitation of acute vascular permeability increase, bladder clearance via intravital ureter imaging, or incorporation into liposomes for drug delivery monitoring.</td>
<td>NEV10177</td>
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<tr>
<th>PROBE</th>
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<th>CAT. NUMBER</th>
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<tbody>
<tr>
<td>IVISense GFR 680</td>
<td>NIR-fluorescent imaging agent to non-invasively determine glomerular filtration rate (GFR) in vivo in models of kidney disease, dysfunction, and drug toxicity.</td>
<td>NEV00000</td>
</tr>
<tr>
<td>IVISense Edema 680</td>
<td>Blood pooling fluorescent probe for imaging circulation, blood vessels, vasculature, vascular leak, including that associated with early oncologic and ophthalmologic lesions. This agent has a short pharmacokinetic profile with bladder clearance, and binds to albumin in blood for a modestly extended (30m-1h) circulation half-life.</td>
<td>NEV10116</td>
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### IVISense™ FLUORESCENT AGENTS

**Vascular In Vivo Imaging Fluorescent Probes**

Revvity’s vascular and physiological agents are a range of highly fluorescent in vivo imaging molecules designed to remain highly stable and localized in the anatomy for various periods of time to enable imaging of disease physiology, vasculature, vascular permeability, and angiogenesis.

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<td>IVISense Vascular 680</td>
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<td>NEV10054EX</td>
</tr>
<tr>
<td>IVISense Vascular 750</td>
<td>Fluorescent nanoparticles for imaging vascularity, perfusion and vascular permeability; long pharmacokinetic profile.</td>
<td>NEV10011EX, NEV10149, NEV10150</td>
</tr>
<tr>
<td>IVISense Gastrointestinal 750</td>
<td>Imaging to monitor gastric emptying and the impact of various drugs on gastric motility; may also be used as an anatomical marker for the stomach.</td>
<td>NEV11121</td>
</tr>
<tr>
<td>IVISense Acute Vascular 680 (1 mg)</td>
<td>Fluorescent probes that enable imaging and quantitation of acute vascular permeability increase, bladder clearance via intravital ureter imaging, or incorporation into liposomes for drug delivery monitoring.</td>
<td>NEV10117, NEV10130, NEV10118, NEV10177</td>
</tr>
<tr>
<td>IVISense GFR 680</td>
<td>NIR-fluorescent imaging agent to non-invasively determine glomerular filtration rate (GFR) in vivo in models of kidney disease, dysfunction, and drug toxicity.</td>
<td>NEV30000</td>
</tr>
<tr>
<td>IVISense Edema 680</td>
<td>Blood pooling fluorescent probe for imaging circulation, blood vessels, vasculature, vascular leak, including that associated with early oncologic and ophthalmologic lesions. This agent has a short pharmacokinetic profile with bladder clearance, and binds to albumin in blood for a modestly extended (30m-1h) circulation half-life.</td>
<td>NEV10116</td>
</tr>
</tbody>
</table>

**Measure Inflammatory Edema Responses in Acute and Chronic Inflammation**

Inflammation induced by the irritant carrageenan (CG) induces cardinal signs of edema, hyperalgesia, and erythema beginning immediately following subcutaneous injection. An acute swelling response occurs due to action of proinflammatory agents, bradykinin, histamine, tachykinins, complement and reactive oxygen, and nitrogen species. Neutrophils rapidly migrate to sites of carrageenan injection and produce cytokines, chemokines, and proinflammatory reactive oxygen and nitrogen species, further driving swelling due to edema and macrophage recruitment.

Fluorescence imaging of CG-injected paws can be used to detect and quantify tissue levels of IVISense Vascular 680 injected shortly after CG injection. Peak tissue fluorescence is quantified three hours post-CG due to accumulation of probe/blood at the peak of edema/erythema. This imaging approach provides a noninvasive means of studying innate acute inflammatory responses that can occur in injury, tissue infection, or vaccination.

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IVISense™ FLUORESCENT AGENTS

Fluorescent Dyes

Revvity’s IVISense fluorescent dyes for labeling antibodies, small molecules, proteins, or peptides are designed specifically to enable customized development of novel superbright fluorescent imaging agents. Dye properties, such as excellent brightness, hydrolytic stability, and photostability, as well as selection for minimal interaction with biological tissues with no potential loss of specificity, have been optimized and validated for use in in vivo or in vitro imaging.

Available as NHS esters or maleimide reactive dyes for conjugation to either free amine (−NH₂) or free thiol (−SH) containing molecules. Conjugate an optimal 1 to 3 dyes onto your protein or choose self-quenching dyes to make your own custom fluorogenic probes.

645, 680, and 800 Fluorescent Dyes

<table>
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<tr>
<th>FLUORESCENT DYE</th>
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<tbody>
<tr>
<td>IVISense 645 NHS Fluorescent Dye (1 mg)</td>
<td>Red fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.</td>
<td>NEV11173</td>
</tr>
<tr>
<td>IVISense 645 NHS Fluorescent Dye (5 mg)</td>
<td>NEV11174</td>
<td></td>
</tr>
<tr>
<td>IVISense 645 MAL Fluorescent Dye (1 mg)</td>
<td>Red fluorescent dye for coupling via maleimide chemistry to label-free cysteines or thiol groups on peptides, small molecules, proteins, antibodies, or macromolecules.</td>
<td>NEV11273</td>
</tr>
<tr>
<td>IVISense 645 MAL Fluorescent Dye (5 mg)</td>
<td>NEV11274</td>
<td></td>
</tr>
<tr>
<td>IVISense 680 NHS Fluorescent Dye (1 mg)</td>
<td>NIR fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.</td>
<td>NEV1119</td>
</tr>
<tr>
<td>IVISense 680 NHS Fluorescent Dye (5 mg)</td>
<td>NEV1120</td>
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</tr>
<tr>
<td>IVISense 680 MAL Fluorescent Dye (1 mg)</td>
<td>NIR fluorescent dye for coupling via maleimide chemistry to label-free cysteines or thiol groups on peptides, small molecules, proteins, antibodies, or macromolecules.</td>
<td>NEV11219</td>
</tr>
<tr>
<td>IVISense 680 MAL Fluorescent Dye (5 mg)</td>
<td>NEV11220</td>
<td></td>
</tr>
<tr>
<td>IVISense 800 NHS Fluorescent Dye (1 mg)</td>
<td>NIR fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.</td>
<td>NEV11107</td>
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<tr>
<td>IVISense 800 NHS Fluorescent Dye (5 mg)</td>
<td>NEV11108</td>
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680 Fluorescent Labeling Kit

<table>
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<tr>
<th>FLUORESCENT DYE</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISense 680 NHS Fluorescent Labeling Kit</td>
<td>An easy and convenient way to label up to 10 mg of protein. The kit contains our superior in vivo optimized dye and everything you need to carry out the reaction and purify the labeled protein.</td>
<td>NEV11118</td>
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680 and 750 Self-Quenching Fluorescent Dyes

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<th>FLUORESCENT DYE</th>
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<tbody>
<tr>
<td>IVISense 680 NHS Fluorescent Self-Quenching Dye (1 mg)</td>
<td>Small-molecule NIR fluorescent dye to label a target ligand. Optimized for single molecule loading or to create your own custom fluorogenic probe. Amine-reactive for labeling via an NHS ester linkage.</td>
<td>NEV10121</td>
</tr>
<tr>
<td>IVISense 680 NHS Fluorescent Self-Quenching Dye (5 mg)</td>
<td>NEV10122</td>
<td></td>
</tr>
<tr>
<td>IVISense 750 NHS Fluorescent Self-Quenching Dye (1 mg)</td>
<td>Small-molecule NIR fluorescent dye to label a target ligand. Optimized for single molecule loading or to create your own custom fluorogenic probe. Amine-reactive for labeling via an NHS ester linkage.</td>
<td>NEV10123</td>
</tr>
<tr>
<td>IVISense 750 NHS Fluorescent Self-Quenching Dye (5 mg)</td>
<td>NEV10124</td>
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</tr>
<tr>
<td>IVISense 750 MAL Fluorescent Self-Quenching Dye (1 mg)</td>
<td>Small-molecule NIR fluorescent dye to label a target ligand. Optimized for single molecule loading or to create your own custom fluorogenic probe. Thiol-reactive for coupling via maleimide chemistry to label-free cysteines or thiol groups.</td>
<td>NEV11223</td>
</tr>
<tr>
<td>IVISense 750 MAL Fluorescent Self-Quenching Dye (5 mg)</td>
<td>NEV11224</td>
<td></td>
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Fluorescent Cell Labeling Dyes

Label and track mammalian cells, including stem cells, T cells, macrophages, and more with IVISense fluorescent cell-labeling dyes. IVISense 680 NIR fluorescent lipophilic labeling dyes intercalates into the cell membrane with an enhanced formulation that allows for quick solubilization in aqueous solution. With no impact on cell viability post-staining and excellent stability, it offers superior brightness and uniform labeling, ideal for cell detection in vitro and longitudinal cell tracking in vivo across many applications including, inflammation, immunology, and stem-cell research.

IVISense 750 DiR is a lipophilic, near-infrared (NIR) fluorescent cyanine dye for staining cytoplasmic membrane.

<table>
<thead>
<tr>
<th>CELL LABELING DYE</th>
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</thead>
<tbody>
<tr>
<td>IVISense 680 Fluorescent Cell Labeling Dye (1 x 0.2mg)</td>
<td>NIR water-soluble cell-labeling agent that can generate brightly labeled and highly viable cells suitable for detection and longitudinal tracking in vivo. Each vial can stain up to 2 x 10^8 cells.</td>
<td>NEVI2001</td>
</tr>
<tr>
<td>IVISense 680 Fluorescent Cell Labeling Dye (5 x 0.2mg)</td>
<td>NIR dye for non-invasive imaging of cell homing (stem cells, T cells).</td>
<td>NEVI2000</td>
</tr>
<tr>
<td>IVISense DiR 750 Fluorescent Cell Labeling Dye</td>
<td>NIR dye for non-invasive imaging of cell homing (stem cells, T cells).</td>
<td>125964</td>
</tr>
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</table>

Macrophage trafficking to carrageenan-inculed inflamed paw (right) and control paw (left) using IVISense 680 fluorescent cell-labeling dye. Imaged using the IVIS Spectrum system.

Thioglycollate-elicited peritoneal macrophages labeled with IVISense 680 fluorescent cell labeling dye (bottom) or unlabeled (top).
IVISense™ FLUORESCENT AGENTS

Fluorescent Imaging Panels

With Revvity's fluorescent in vivo imaging panels, choosing the probes you need for your research has never been easier. Specially curated using our most published agents, IVISense Fluorescent Panels contain probes that are carefully bundled together to target key disease areas.

Designed to optimize your findings and maximize your in vivo imaging research studies, IVISense Fluorescent Panels enable the early detection and characterization of multiple disease-specific biomarkers in the same subject, for longitudinal bioprofiling over the course of the study.

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<tr>
<th>FLUORESCENT PANEL</th>
<th>PART NO</th>
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<th>IVISense FLUORESCENT PANEL CONTENTS</th>
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<tbody>
<tr>
<td>Toxicology Panel</td>
<td>NEV2016</td>
<td>Detect molecular players and measure early changes in drug-induced injury.</td>
<td>Vascular 680 Annexin-V 750 MMP 750 FAST* Renin-Receptor 680 FAST Transferin-Receptor 750</td>
</tr>
<tr>
<td>Oncology Panel</td>
<td>NEV2005</td>
<td>Non-invasively characterize the tumor environment to assess biological changes associated with disease progression or treatment efficacy.</td>
<td>Vascular 680 Folate Receptor 680 Integrin Receptor 750 MMP 750 FAST Pan Cathepsin 750</td>
</tr>
<tr>
<td>Inflammation Panel</td>
<td>NEV2013</td>
<td>Quantify inflammation biology, particularly in longitudinal studies for understanding disease pathogenesis.</td>
<td>Vascular 680 Folate Receptor 680 Integrin Receptor 750 MMP 750 FAST Neutrophil Elastase 680 FAST Pan Cathepsin 750 FAST</td>
</tr>
<tr>
<td>Vascular Panel</td>
<td>NEV2014</td>
<td>Characterize biological changes associated with vascular injury and disease.</td>
<td>Vascular 680 CAT B 680 FAST Integrin Receptor 750 MMP 750 FAST Pan Cathepsin 750 FAST</td>
</tr>
<tr>
<td>Featured Probes Pack</td>
<td>NEV2011</td>
<td>Approach different research areas by sampling our most popular and published fluorescent probes.</td>
<td>Vascular 680 Folate Receptor 680 Integrin Receptor 750 MMP 750 FAST Pan Cathepsin 680 680 NHS Fluorescent Labeling Kit</td>
</tr>
<tr>
<td>Sample Pack</td>
<td>NEV2000</td>
<td>Combine fluorescence and bioluminescent imaging by sampling our most popular and published fluorescent probes, as well as ready-to-use injectable luciferin for bioluminescent imaging.</td>
<td>Vascular 680 Integrin Receptor 750 MMP 750 FAST Pan Cathepsin 750 IVISbrite® D-Luciferin - RediJect™ Solution</td>
</tr>
</tbody>
</table>

*2 MMP are provided for the Annexin/MMP/Transferin cocktail as detailed in the Fluorescent Panel User Guide.

All panels contain full size fluorescent probes (750 doses) except for the Sample Pack which contains sample sizes (3 doses) of each fluorescent probe and 1 full size IVISbrite D-Luciferin - RediJect Solution (50 doses).

Panels are not open to substitution.

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Fluorescent Agents by Disease Area

Built around your applications—choose one, or use in combination for your disease focus to obtain more information.

Fluorescent Agents

Easily activated fluorescence probes enable specific imaging of biological processes that underlie disease

IVISense Cat B 680 FAST  •  •  •  •  •  •  •  •  •  •
IVISense Cat B 750 FAST  •  •  •  •  •  •  •  •  •
IVISense Cat K 680 FAST  •  •  •  •  •  •
IVISense MMP 680  •  •  •  •  •  •  •  •
IVISense MMP 645 FAST  •  •  •  •  •  •  •  •  •
IVISense MMP 750 FAST  •  •  •  •  •  •  •  •  •  •
IVISense Neutrophil Elastase 680 FAST  •  •  •  •  •
IVISense Pan Cathepsin 680  •  •  •  •  •  •  •  •
IVISense Pan Cathepsin 750  •  •  •  •  •  •
IVISense Pan Cathepsin 750 FAST  •  •  •  •  •  •
IVISense Renin Receptor 680 FAST  •  •  •  •  •

Targeted probes enable specific areas of interest to be detected, monitored, and measured in vivo

IVISense 2-Deoxy-6-Phosphate 750 RediJect Solution
IVISense Annexin-V 750  •  •  •  •  •  •  •
IVISense Bacterial - RediJect Solution
IVISense Folate Receptor 680  •  •  •  •  •  •  •  •
IVISense Integrin Receptor 645  •  •  •  •  •  •  •  •
IVISense Integrin Receptor 750  •  •  •  •  •  •  •  •  •
IVISense Hypoxia CA IX 680
IVISense IVISbrite MPO 425 - RediJect Solution  •  •  •
IVISense Osteo 680  •  •  •  •  •  •
IVISense Osteo 750  •  •  •  •  •  •
IVISense Osteo 800
IVISense Tomato Lectin 680  •  •  •  •
IVISense Tomato Lectin 750  •  •  •  •
IVISense Tomato Lectin 800
IVISense Transferrin-Receptor 680
IVISense Transferrin-Receptor 750  •  •

Vascular and physiologic fluorescence agents are distributed passively through blood vessels to enable imaging of vascularity, blood pooling near tumors, and edema

IVISense Vascular 680  •  •  •  •  •  •  •  •  •  •
IVISense Vascular 750  •  •  •  •  •  •  •
IVISense Vascular NP 680  •  •  •  •  •  •
IVISense Vascular NP 750  •  •  •  •  •  •
IVISense Edema 680  •  •  •  •  •  •
**IVISbrite™ BIOLUMINESCENT REAGENTS**

**The Sensitivity and Reproducibility You Need**

Get the sensitivity and reproducibility you need from your *in vivo* imaging studies with our *in vivo* validated substrates, lentiviral particles, luciferase tumor cell lines, and bacteria.

**Bioluminescent/Chemiluminescent Substrates**

Revvity’s IVISbrite bioluminescent substrates are available in easy-to-use formats that fit your *in vivo* imaging laboratory workflow. Choose firefly D-luciferin for use in your *in vitro* or *in vivo* applications, such as with our Red F-luc (*Luciola italica*) luciferase, or coelenterazine h, the substrate of many aquatic luciferases such as our *Renilla reniformis* luciferase.

**RediJect™ solution** – a pre-formulated, ready-to-use format that reduces preparation time and effort while still delivering ultimate sensitivity and reproducibility that is critical for accurate quantitation.

**Lyophilized D-Luciferin** – offers the same sensitivity and high performance as the RediJect formulation. Available in 1 gram and higher quantities for volume savings.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISbrite D-Luciferin Potassium Salt (1g)</td>
<td>Lyophilized bioluminescence substrate for <em>in vivo</em> imaging with firefly luciferase</td>
<td>122799</td>
</tr>
<tr>
<td>IVISbrite D-Luciferin Potassium Salt (5 x 1g)</td>
<td>Pre-formulated in PBS, batch-controlled D-luciferin (K+ salt) ready for <em>in vivo</em> use</td>
<td>770504</td>
</tr>
<tr>
<td>IVISbrite D-Luciferin Potassium Salt (10 x 1g)</td>
<td>Pre-formulated in PBS, batch-controlled D-luciferin (K+ salt) for <em>in vivo</em> use. Includes a rapidly clearing fluorescent marker to validate substrate injection</td>
<td>770505</td>
</tr>
<tr>
<td>IVISbrite D-Luciferin in RediJect Solution</td>
<td>Pre-formulated in PBS, batch-controlled D-luciferin (K+ salt) for <em>in vivo</em> use</td>
<td>760506</td>
</tr>
<tr>
<td>IVISbrite Coelenterazine h in RediJect Solution</td>
<td>Pre-formulated in PBS, batch controlled coelenterazine h for <em>in vivo</em> use</td>
<td>760506</td>
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</table>

**Kinetics of IVISbrite D-luciferin RediJect bioluminescence imaging in a flank 4T1 mouse breast adenocarcinoma.**

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**IVISbrite™ BIOLUMINESCENT REAGENTS**

**Brighter, Red-Shifted Tumor Cell Lines**

Expand into orthotopic deep tissue oncology models with brighter, red-shifted cell lines. Revvity’s IVISbrite™ bioluminescent light-producing tumor cell lines are significantly brighter than other firefly luciferases. These cells have been stably transduced with the red-shifted firefly luciferase gene from Luciola italica (Red F-luc), for a brighter signal. By emitting intensified, longer wavelength light, our bioluminescent tumor cell lines allow you to visualize and monitor the growth of deep tissue tumors in vivo. The optimized Red F-luc luciferase enables more sensitive imaging with less tissue attenuation so you can detect tumor development earlier and monitor tumor growth and metastases in both subcutaneous and orthotopic models.

**TUMOR CELL LINE PRODUCT DESCRIPTION CAT. NUMBER**

<table>
<thead>
<tr>
<th>TUMOR CELL LINE</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISbrite U-87 MG Red F-luc</td>
<td>Brain, glioblastoma (Human)</td>
<td>BW 124577</td>
</tr>
<tr>
<td>IVISbrite GL261 Red F-luc</td>
<td>Brain, glioma (Murine)</td>
<td>BW 134246</td>
</tr>
<tr>
<td>IVISbrite 4T1 Red F-luc</td>
<td>Breast mammary adenocarcinoma (Murine)</td>
<td>BW 124087</td>
</tr>
<tr>
<td>IVISbrite MCF-7 Red F-luc</td>
<td>Breast mammary adenocarcinoma (Human)</td>
<td>BW 119262</td>
</tr>
<tr>
<td>IVISbrite HCT-116 Red F-luc</td>
<td>Colorectal carcinoma (Human)</td>
<td>BW 124318</td>
</tr>
<tr>
<td>IVISbrite HT-29 Red F-luc</td>
<td>Colorectal carcinoma (Human)</td>
<td>BW 124353</td>
</tr>
<tr>
<td>IVISbrite Colo205 Red F-luc</td>
<td>Colorectal adenocarcinoma (Human)</td>
<td>BW 124317</td>
</tr>
<tr>
<td>IVISbrite HT1080 Red F-luc</td>
<td>Fibrosarcoma (Human)</td>
<td>BW 128092</td>
</tr>
<tr>
<td>IVISbrite HepG2 Red F-luc</td>
<td>Hepatic carcinoma (Human)</td>
<td>BW 134280</td>
</tr>
<tr>
<td>IVISbrite K-562 Red F-luc</td>
<td>Leukemia, Chronic Myelogenous Leukemia (Human)</td>
<td>BW 124735</td>
</tr>
<tr>
<td>IVISbrite A549 Red F-luc</td>
<td>Lung carcinoma (Human)</td>
<td>BW 119266</td>
</tr>
<tr>
<td>IVISbrite LL/2 Red F-luc</td>
<td>Lung carcinoma (Murine)</td>
<td>BW 119267</td>
</tr>
</tbody>
</table>

**IVISbrite Tumor Cell Lines Dual Labeled With Enhanced Red F-Luc Vector and Green Fluorescent Protein (GFP)**

<table>
<thead>
<tr>
<th>TUMOR CELL LINE</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISbrite 4T1-Red-Fluc-GFP</td>
<td>Breast mammary adenocarcinoma (Murine) dual-labeled with luciferase and GFP</td>
<td>BW 128090</td>
</tr>
<tr>
<td>IVISbrite PC-3-Red-Fluc-GFP</td>
<td>Prostate adenocarcinoma (Human) dual-labeled with luciferase and GFP</td>
<td>BW 133416</td>
</tr>
</tbody>
</table>
**IVISbrite™ BIOLUMINESCENT REAGENTS**

**Lentiviral Particles – Create the Bioluminescent Cell Line You Need**

Stably transduce cells with lentivirus particles expressing a combination of novel luciferases and a fluorescent protein for monitoring and tracking cells *in vivo*. IVISbrite lentiviral particles are self-inactivating vectors containing the brighter, red-shifted Red F-luc firefly luciferase (*Luciola italica*) or green-shifted Renilla luciferase (*Renilla reniformis*) transgene under control of the stable UbC promoter. These lentiviral particles enable efficient transduction of a wide variety of mammalian cells including most cancer cell lines, primary, stem, and non-dividing cells. Use our bioluminescent D-luciferin or coelenterazine substrates to image your transduced cells *in vivo*.

<table>
<thead>
<tr>
<th>PRODUCT</th>
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<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISbrite Red F-luc-Puromycin Lentiviral Particles</td>
<td>Red-shifted firefly luciferase with puromycin as selection marker</td>
<td>CLS960002</td>
</tr>
<tr>
<td>IVISbrite Red F-luc-GFP Lentiviral Particles</td>
<td>Red-shifted firefly luciferase and green fluorescent protein (GFP)</td>
<td>CLS960003</td>
</tr>
<tr>
<td>IVISbrite Green Renilla-Puromycin Lentiviral Particles</td>
<td>Green Renilla luciferase with puromycin as selection marker</td>
<td>CLS960004</td>
</tr>
</tbody>
</table>

*In vivo* bioluminescence imaging of mice implanted with PC3 prostate cancer cells transduced by IVISbrite Red F-luc Puromycin Lentiviral Particles (week 1, 2, 3, 4, and 5).
Optical in vivo imaging technology has been successfully used to non-invasively measure the spread of infection, monitor infection dynamics, and determine the in vivo efficacy of antimicrobial compounds in various infectious disease models. Revvity offers a range of bacterial strains labeled with the *Photorhabdus luminescens* lux operon (including biofilm forming strains) for a variety of in vitro and in vivo applications. One advantage of bacterial luciferase is that it negates the use of an exogenous substrate such as luciferin.

### BACTERIUM PARENTAL STRAIN CAT. NUMBER

<table>
<thead>
<tr>
<th>BACTERIUM</th>
<th>PARENTAL STRAIN</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVISbrite Escherichia coli Xen14</td>
<td>EPEC WS2572</td>
<td>119223</td>
</tr>
<tr>
<td>IVISbrite Listeria monocytogenes Xen19</td>
<td>ATCC 23074</td>
<td>119237</td>
</tr>
<tr>
<td>IVISbrite Pseudomonas aeruginosa Xen5</td>
<td>ATCC 19660</td>
<td>119228</td>
</tr>
<tr>
<td>IVISbrite Pseudomonas aeruginosa Xen41</td>
<td>PAD1</td>
<td>119229</td>
</tr>
<tr>
<td>IVISbrite Shigella dysenteriae Xen27</td>
<td>88A8265 Clinical isolate</td>
<td>119231</td>
</tr>
<tr>
<td>IVISbrite Proteus mirabilis Xen44</td>
<td>ATCC 51286</td>
<td>119236</td>
</tr>
<tr>
<td>IVISbrite Salmonella (phimurium Xen33</td>
<td>FDA1189</td>
<td>119235</td>
</tr>
<tr>
<td>IVISbrite Yersinia enterocolitica Xen24</td>
<td>91AT854 Clinical isolate</td>
<td>119232</td>
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<tr>
<td>IVISbrite Yersinia enterocolitica Xen25</td>
<td>WS2589</td>
<td>119233</td>
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<tr>
<td>IVISbrite Staphylococcus aureus Xen8.1</td>
<td>8325-4</td>
<td>119239</td>
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<td>IVISbrite Staphylococcus aureus Xen29</td>
<td>ATCC 12600</td>
<td>119240</td>
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<td>IVISbrite Staphylococcus aureus Xen31</td>
<td>ATCC 33591</td>
<td>119242</td>
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<tr>
<td>IVISbrite Staphylococcus aureus Xen36</td>
<td>ATCC 49525</td>
<td>119243</td>
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<tr>
<td>IVISbrite Staphylococcus aureus Xen40</td>
<td>UAMS-1</td>
<td>119244</td>
</tr>
</tbody>
</table>
**VesselVue® MICROBUBBLE CONTRAST AGENTS**

**Visualize Microvasculature Like Never Before**

Contrast-enhanced ultrasound is a technique that uses microbubble-based contrast agents to improve the echogenicity of blood which in turn enhances and aids in the visualization of large vessels and tissue vascularity.

Revvity’s VesselVue® microbubble contrast agents are lipid encapsulated micron-sized particles with a gas core that are injected intravenously into the animal. These agents are non-toxic to the animal, and with each microbubble being smaller than a red blood cell, circulates systemically and clears the body in minutes.

VesselVue microbubble agents, when used with an ultrasound system with a contrast enhanced imaging mode such as Acoustic Angiography on Revvity’s Vega® system, enables high-sensitivity imaging of microvasculature in tumors and organs and can be used to evaluate angiogenesis or explore therapy response or injury changes to tissue over time.

VesselVue microbubble contrast agents are available in two formulations to suit your applications

<table>
<thead>
<tr>
<th>CONTRAST AGENT</th>
<th>PRODUCT DESCRIPTION</th>
<th>CAT. NUMBER</th>
</tr>
</thead>
</table>
| VesselVue P-Formulation (Polydisperse) | Ideal for acoustic angiography and general imaging applications  
  - Wider size distribution  
  - Smaller mean diameter  
  - Requires activation using VesselVue Microbubble Mixer (sold separately) | P-4007001  |
| VesselVue S-Formulation (Size selected) | Improved signal sensitivity for specific applications such as molecular imaging  
  - Narrower size distribution  
  - Larger mean diameter  
  - Ready-to-use, does not require mixing | S-6003001  |

(Top) Tumor and (right) kidney vascularity using VesselVue microbubble contrast agents and acoustic angiography using Revvity’s Vega® ultrasound imaging system.

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### IN VIVO IMAGING SYSTEMS

Revivity offers a wide range of imaging systems designed to fit your research and development needs.

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<th>MicroCT</th>
<th>Ultrasound</th>
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<tr>
<td><strong>IVIS® Lumina Series III</strong></td>
<td><strong>IVIS® Lumina S5 &amp; X5</strong></td>
<td><strong>Vega®</strong></td>
</tr>
<tr>
<td>- 2D optical imaging</td>
<td>- 2D optical imaging</td>
<td>- Automated, hands-free</td>
</tr>
<tr>
<td>- Imaging of up to 5 mice</td>
<td>- Imaging of up to 10 mice using optional manifold</td>
<td>- High-throughput 3 mice imaging</td>
</tr>
<tr>
<td>- Optional integrated high-resolution x-ray</td>
<td>- Fully automated, one-click co-registration with IVIS SpectrumCT</td>
<td>- Scan times in &lt; 1 minute</td>
</tr>
<tr>
<td>- Optional Smart accessories to streamline imaging workflow</td>
<td>- Seamlessly co-register 3D optical and hi-res microCT data</td>
<td>- Whole body field of view</td>
</tr>
<tr>
<td>- MVI-2 for automated 360 degree imaging</td>
<td>- Two powerful modes of fluorescence excitation—epi- and trans-illumination</td>
<td>- Multiple 3D imaging modes</td>
</tr>
<tr>
<td><strong>IVIS® Spectrum 2 Series</strong></td>
<td><strong>Quantum GX3</strong></td>
<td><strong>In Vivo Imaging Instruments</strong></td>
</tr>
<tr>
<td>- 2D and 3D optical imaging</td>
<td>- High spatial resolution</td>
<td><strong>Support</strong></td>
</tr>
<tr>
<td>- Imaging of up to 10 mice using optional manifold</td>
<td>- Low dose microCT for longitudinal imaging</td>
<td><strong>Contact Us</strong></td>
</tr>
<tr>
<td>- Optional integrated high-resolution x-ray</td>
<td>- Step and continuous imaging modes</td>
<td></td>
</tr>
<tr>
<td>- Optional Smart accessories to streamline imaging workflow</td>
<td>- Cardiac and respiratory gating</td>
<td></td>
</tr>
<tr>
<td>- MVI-2 for automated 360 degree imaging</td>
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**In Vivo Imaging Instruments**

**Support**

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The support you need to achieve your research goals

Application Support
Offering worldwide support, our dedicated applications team with their in-depth scientific knowledge can help you achieve your research goals. By offering unmatched support, our application scientists are your main contact for any questions you may have from development of imaging protocols to training and education ensuring you get the answers and guidance you need.

Training and Education
Get the most from your in vivo imaging research by learning from the experts. We offer basic and advanced training at your facility as well as classroom training through In Vivo University to broaden your knowledge, share with fellow researchers, and learn from field application scientists.

Service
Our global service engineers are available to help you with installation, preventative maintenance, technical guidance, and any repair services to ensure that your imaging system operates as optimally as possible to meet your in vivo imaging research goals.

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