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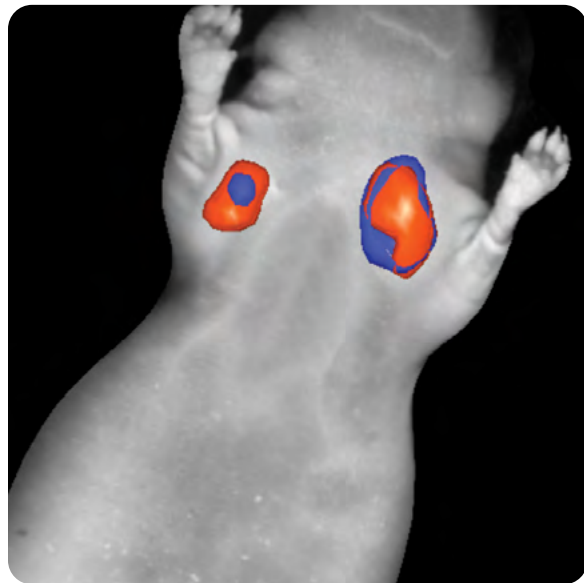
# *In Vivo* imaging reagents

Bioluminescent Reagents and Fluorescent Probes, Dyes, and Labels

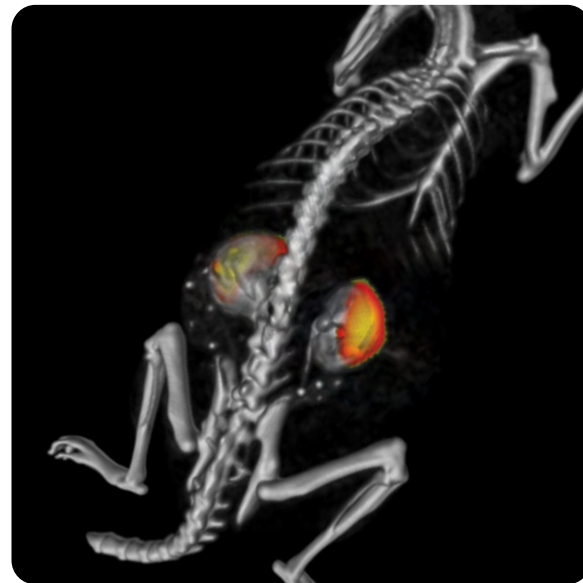
## INTRODUCTION

# More Insightful Research Results

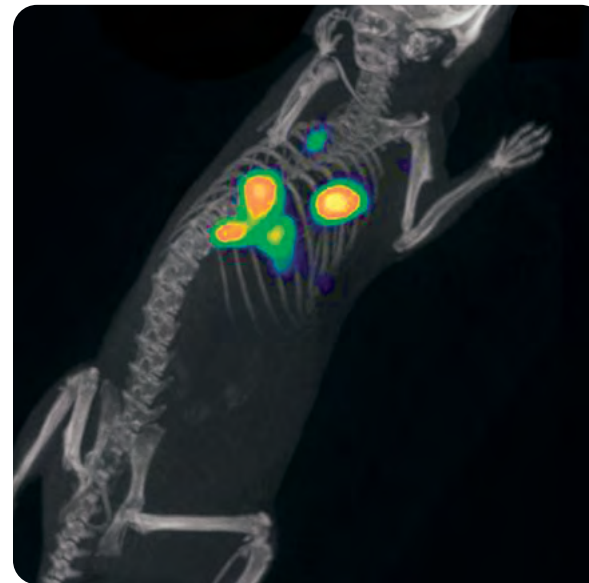
Our comprehensive range of bioluminescent and fluorescent imaging agents provides researchers with tools to better understand early disease-related biological changes, track disease progression, help guide the drug discovery process, and evaluate efficacy and safety of drug candidates. All of our optical imaging reagents, probes, labels, and dyes have been optimized 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

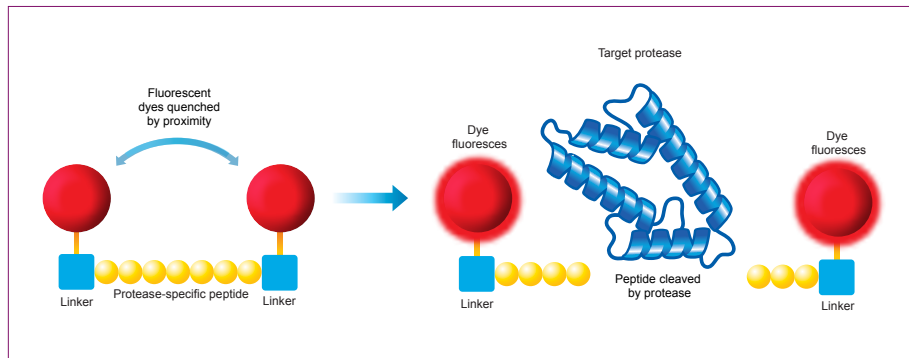
# Detect, Understand, and Characterize Disease Earlier

Revvity's comprehensive suite of fluorescent imaging agents, designed for use in your *in vivo* research, enables 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.



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		NEV10001EX
IVISense Pan Cathepsin 750 FAST	FAST version of ProSense, with faster kinetics and a broader imaging window.	NEV11171
IVISense Renin 680 FAST	Imaging of renin-angiotensin pathway associated with hypertension, and kidney and cardiovascular disease.	NEV11079

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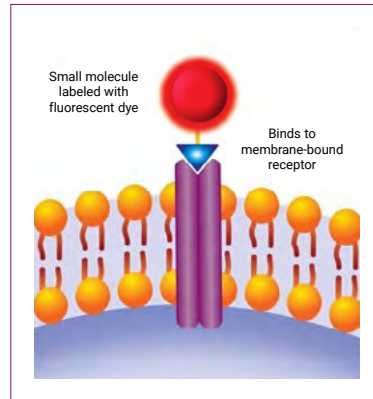
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## IVISense® FLUORESCENT AGENTS

### 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.



PROBE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense Annexin-V 750	<i>In vivo</i> targeting of membrane-bound phosphatidylserine exposed during the early stages of apoptosis.	NEV11053
IVISense Bombesin Receptor 680	Target and quantify up-regulation of bombesin receptors (BBR) <i>in vivo</i> associated with tumor proliferation. These receptors are also over-expressed in a variety of cancers.	NEV10090
IVISense Folate Receptor 680	Highly specific and sensitive in the detection of folate receptor proteins. Can be used to closely monitor and quantitate tumor growth and metabolism.	NEV10040
IVISense Hypoxia CA IX 680	Detects the tumor cell surface expression of carbonic anhydrase 9 (CA IX) protein, which increases in hypoxic regions within many tumors.	NEV11070
IVISense Integrin Receptor 645	Targets integrin $\alpha\beta3$ expressed in oncology, atherosclerosis, and angiogenesis disease models.	NEV10640
IVISense Integrin Receptor 680		NEV10645
IVISense Integrin Receptor 750		NEV10873

PROBE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense Osteo 680	Optimized imaging of bone turnover through binding of hydroxyapatite.	NEV10020EX
IVISense Osteo 750		NEV10053EX
IVISense Osteo 800		NEV11105
IVISense Tomato Lectin 680	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 <i>in vivo</i> .	NEV10060
IVISense Transferrin Receptor 750	NIR-labeled transferrin detects transferrin receptor upregulation associated with the increased cell metabolic need for iron in cancer and inflammatory cells. Also detects normal iron metabolism in the liver.	NEV10091

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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.

PROBE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense Vascular 680	Imaging of vascularity, perfusion, and vascular permeability. Remains localized in vasculature for 0-4 h; accumulates in tumors and arthritic joints at 24 h.	NEV10054EX
IVISense Vascular 750		NEV10011EX
IVISense Vascular NP 680	Fluorescent nanoparticles for imaging vascularity, perfusion and vascular permeability; long pharmacokinetic profile.	NEV10149
IVISense Vascular NP 750		NEV10150
IVISense Gastrointestinal 750	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.	NEV11121
IVISense Acute Vascular 680 (1 mg)	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.	NEV10117
IVISense Acute Vascular 680 (5 mg)		NEV10130
IVISense Acute Vascular 750 (1 mg)		NEV10118
IVISense Acute Vascular 750 (5 mg)		NEV10177

PROBE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense GFR 680	NIR-fluorescent imaging agent to non-invasively determine glomerular filtration rate (GFR) <i>in vivo</i> in models of kidney disease, dysfunction, and drug toxicity.	NEV30000
IVISense Edema 680	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.	NEV10116

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## IVISense® FLUORESCENT AGENTS

### Vascular

Revvity's various performance

#### PROBE

IVISense Vas

IVISense Vas

IVISense Vas

IVISense Vas

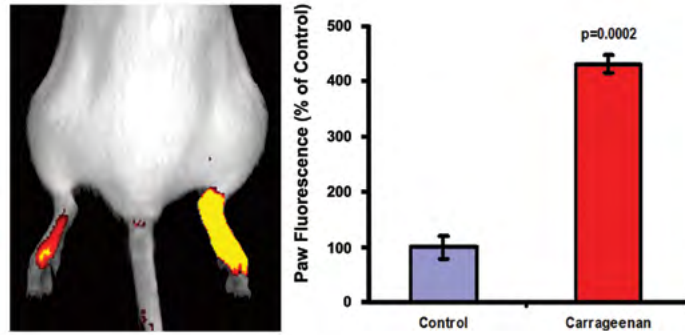
IVISense Gastrointest

IVISense Ac Vascular 68

IVISense Ac Vascular 68

IVISense Ac Vascular 75

IVISense Ac Vascular 75



### 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.



Measure Inflammatory Edema Responses in Acute and Chronic Inflammation



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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 for use in *in vivo* or *in vitro* imaging.

Available as NHS esters or maleimide reactive dyes for conjugation to either free amine (-NH<sub>2</sub>) 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

FLUORESCENT DYE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense 645 NHS Fluorescent Dye (1 mg)	Red fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.	NEV11173
IVISense 645 NHS Fluorescent Dye (5 mg)		NEV11174
IVISense 645 MAL Fluorescent Dye (1 mg)	Red fluorescent dye for coupling via maleimide chemistry to label-free cysteines or thiol groups on peptides, small molecules, proteins, antibodies, or macromolecules.	NEV11273
IVISense 645 MAL Fluorescent Dye (5 mg)		NEV11274
IVISense 680 NHS Fluorescent Dye (1 mg)	NIR fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.	NEV11119
IVISense 680 NHS Fluorescent Dye (5 mg)		NEV11120
IVISense 680 MAL Fluorescent Dye (1 mg)	NIR fluorescent dye for coupling via maleimide chemistry to label-free cysteines or thiol groups on peptides, small molecules, proteins, antibodies, or macromolecules.	NEV11219
IVISense 680 MAL Fluorescent Dye (5 mg)		NEV11220
IVISense 800 NHS Fluorescent Dye (1 mg)	NIR fluorescent amine-reactive dye for labeling via an NHS ester to peptides, small molecules, proteins, antibodies, or macromolecules.	NEV11107
IVISense 800 NHS Fluorescent Dye (5 mg)		NEV11108

#### 680 Fluorescent Labeling Kit

FLUORESCENT DYE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense 680 NHS Fluorescent Labeling Kit	An easy and convenient way to label up to 10 mg of protein. The kit contains our superior <i>in vivo</i> optimized dye and everything you need to carry out the reaction and purify the labeled protein.	NEV11118

#### 680 and 750 Self-Quenching Fluorescent Dyes

FLUORESCENT DYE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense 680 NHS Fluorescent Self-Quenching Dye (1 mg)	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.	NEV10121
IVISense 680 NHS Fluorescent Self-Quenching Dye (5 mg)		NEV10122
IVISense 750 NHS Fluorescent Self-Quenching Dye (1 mg)	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.	NEV10123
IVISense 750 NHS Fluorescent Self-Quenching Dye (5 mg)		NEV10124
IVISense 750 MAL Fluorescent Self-Quenching Dye (1 mg)	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.	NEV11223
IVISense 750 MAL Fluorescent Self-Quenching Dye (5 mg)		NEV11224

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## IVISense® FLUORESCENT AGENTS

### Fluorescent Cell Labeling Dyes

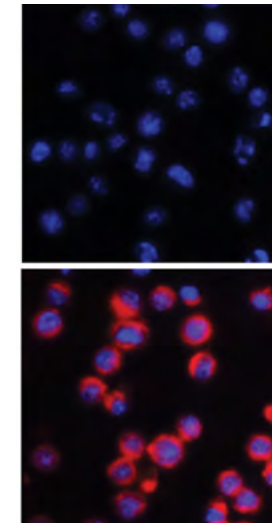
Label and track mammalian cells, including stem cells, T cells, macrophages, and more with IVISense fluorescent cell-labeling dyes. IVISense 680 NIR fluorescent lipophilic labeling dyes intercalates into the cell membrane with an enhanced formulation that allows for quick solubilization in aqueous solution. 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.

CELL LABELING DYE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISense 680 Fluorescent Cell Labeling Dye (1 x 0.2mg)	NIR water-soluble cell-labeling agent that can generate brightly labeled and highly viable cells suitable for detection and longitudinal tracking <i>in vivo</i> . Each vial can stain up to $2 \times 10^8$ cells.	NEV12001
IVISense 680 Fluorescent Cell Labeling Dye (5 x 0.2mg)		NEV12000
IVISense DiR 750 Fluorescent Cell Labeling Dye	NIR dye for non-invasive imaging of cell homing (stem cells, T cells).	125964



Macrophage trafficking to carrageenan-induced 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).

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## 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.

FLUORESCENT PANEL	PART NO	USED TO	IVISense FLUORESCENT PANEL CONTENTS		
Arthritis Panel	NEV20003	Detect molecular players in arthritis pathology.	Vascular 750 CAT B 750 FAST	CAT K 680 FAST MMP 680	Osteo 680 Pan Cathepsin 680
Tumor Metabolism Panel	NEV20015	Non-invasively measure tumor microenvironment biology for early detection of treatment-induced biological changes.	Vascular 680 Annexin-V 750 Bombesin Receptor 680	Folate Receptor 680 MMP 750 FAST	Pan Cathepsin 680 Transferrin-Receptor 750
Toxicology Panel	NEV20016	Detect molecular players and measure early changes in drug-induced injury.	Vascular 680 Annexin-V 750	MMP 750 FAST* Renin Receptor 680 FAST	Transferrin-Receptor 750
Oncology Panel	NEV20005	Non-invasively characterize the tumor environment to assess biological changes associated with disease progression or treatment efficacy.	Vascular 680 Folate Receptor 680	Integrin Receptor 750 MMP 750 FAST	Pan Cathepsin 750
Inflammation Panel	NEV20013	Quantify inflammation biology, particularly in longitudinal studies for understanding disease pathogenesis.	Vascular 680 Folate Receptor 680	Integrin Receptor 750 MMP 750 FAST	Neutrophil Elastase 680 FAST Pan Cathepsin 750 FAST
Vascular Panel	NEV20014	Characterize biological changes associated with vascular injury and disease.	Vascular 680 CAT B 680 FAST	Integrin Receptor 750 MMP 750 FAST	Pan Cathepsin 750 FAST
Featured Probes Pack	NEV20011	Approach different research areas by sampling our most popular and published fluorescent probes.	Vascular 680 Folate Receptor 680	Integrin Receptor 750 MMP 750 FAST	Pan Cathepsin 680 680 NHS Fluorescent Labeling Kit
Sample Pack	NEV20000	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.	Vascular 680 Integrin Receptor 750	MMP 750 FAST Pan Cathepsin 750	IVISbrite® D-Luciferin - RediJect™ Solution

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

All panels contain full size fluorescent probes (10 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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# IVISense® FLUORESCENT AGENTS

## Fluorescent Agents by Disease Area

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

	Angiogenesis	Apoptosis	Arthritis	Atherosclerosis	Bone Loss	Cardiovascular Disease	Hypertension	Infectious Disease	Inflammation	Kidney Function	Oncology	Pulmonary Disease	Vascular Disease	Arthritis Panel	Tumor Metabolism Panel	Toxicology Panel	Oncology Panel	Inflammation Panel	Vascular Panel
<b>Easily activated fluorescence probes enable specific imaging of biological processes that underlie disease</b>																			
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							•			•						•			
<b>Targeted probes enable specific areas of interest to be detected, monitored, and measured <i>in vivo</i></b>																			
IVISense 2-DG 750 RediJect Solution											•								
IVISense Annexin-V 750		•		•							•				•	•			
IVISense Bacterial 750 - 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 Bombesin Receptor 680											•			•					
IVISense Transferrin-Receptor 750											•			•	•				
<b>Vascular and physiologic fluorescence agents are distributed passively through blood vessels to enable imaging of vascularity, blood pooling near tumors, and edema</b>																			
IVISense Vascular 680	•		•						•		•	•	•		•	•	•	•	•
IVISense Vascular 750	•		•						•		•	•	•	•					
IVISense Vascular NP 680	•		•	•					•		•	•	•						
IVISense Vascular NP 750	•		•	•					•		•	•	•						
IVISense Edema 680	•		•						•		•	•	•						

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## IVISbrite® BIOLUMINESCENT REAGENTS

# The Sensitivity and Reproducibility You Need

Enhance the sensitivity and consistency of your *in vivo* imaging research with our substrates, lentiviral vectors, luciferase-expressing cell lines, and bacteria. These reagents offer reliable performance and support diverse experimental designs.

### 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.

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



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

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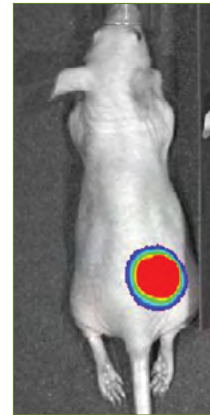
## IVISbrite® BIOLUMINESCENT REAGENTS

### 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.

#### IVISbrite Tumor Cell Lines Labeled With Enhanced Red F-Luc Vector

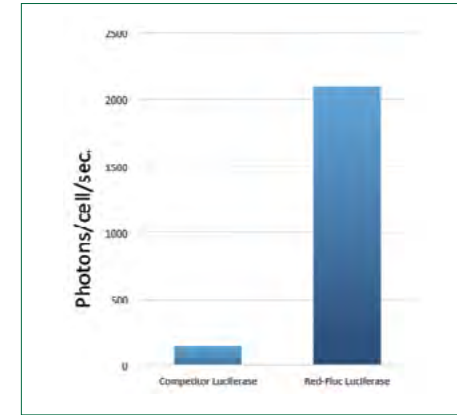
TUMOR CELL LINE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISbrite U-87 MG Red F-luc	Brain, glioblastoma (Human)	BW 124577
IVISbrite GL261 Red F-luc	Brain, glioma (Murine)	BW 134246
IVISbrite 4T1 Red F-luc	Breast mammary adenocarcinoma (Murine)	BW 124087
IVISbrite MCF-7 Red F-luc	Breast mammary adenocarcinoma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



Bioluminescence imaging of IVISbrite HCT-116 Red F-luc subcutaneous tumor. Imaged using the IVIS Spectrum.



Bioluminescence imaging of IVISbrite U87 MG Red F-luc orthotopic tumor. Imaged using the IVIS Spectrum.



In Vivo Comparison: Five million of both IVISbrite HepG2 Red F-luc tumor cells and competitor luciferase transduced HepG2 cells were injected s.c. in the flank of nude mice; tumors were imaged after five weeks. Red F-luc transduced cells generate 15 times brighter bioluminescence signal than the corresponding transduced cells despite similar tumor size. (Peterson, et al. 2014). Brightness varies by cell line.

#### IVISbrite Tumor Cell Lines Labeled With Enhanced Red F-Luc Vector

TUMOR CELL LINE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISbrite NCI-H460 Red F-luc	Lung adenocarcinoma (Human)	BW 124316
IVISbrite SKOV3 Red F-luc	Ovarian adenocarcinoma (Human)	BW 119276
IVISbrite BxPC3 Red F-luc	Pancreatic adenocarcinoma (Human)	BW 125058
IVISbrite PC-3 Red F-luc	Prostate adenocarcinoma (Human)	BW 128444
IVISbrite LnCaP Red F-luc	Prostate, supraclavicular lymph node carcinoma (Human)	BW 125055
IVISbrite B16-F10 Red F-luc	Skin melanoma (Murine)	BW 124734

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

TUMOR CELL LINE	PRODUCT DESCRIPTION	CAT. NUMBER
IVISbrite 4T1-Red-Fluc-GFP	Breast mammary adenocarcinoma (Murine) dual-labeled with luciferase and GFP	BW 128090
IVISbrite PC-3-Red-Fluc-GFP	Prostate adenocarcinoma (Human) dual-labeled with luciferase and GFP	BW 133416

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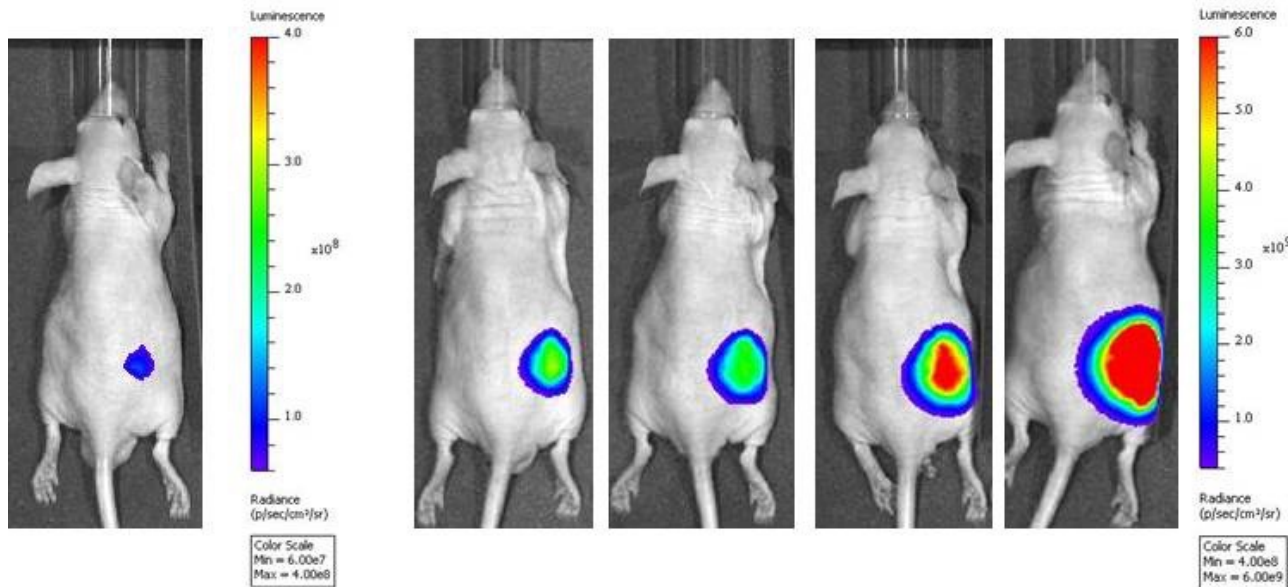
## IVISbrite® BIOLUMINESCENT REAGENTS

### 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*.

PRODUCT	PRODUCT DESCRIPTION	CAT. NUMBER
IVISbrite Red F-luc-Puromycin Lentiviral Particles	Red-shifted firefly luciferase with puromycin as selection marker	CLS960002
IVISbrite Red F-luc-GFP Lentiviral Particles	Red-shifted firefly luciferase and green fluorescent protein (GFP)	CLS960003
IVISbrite Green Renilla-Puromycin Lentiviral Particles	Green Renilla luciferase with puromycin as selection marker	CLS960004



*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).*

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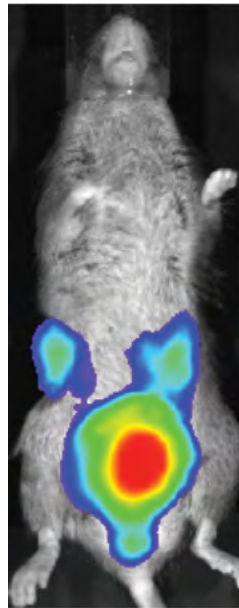


# IVISbrite® BIOLUMINESCENT REAGENTS

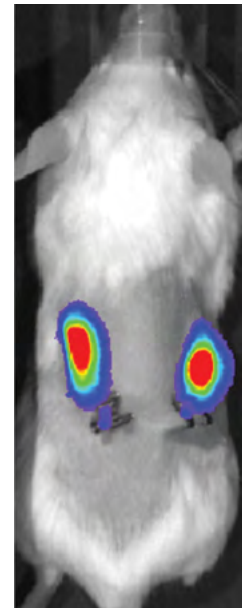
## Optical Reporter Bacteria

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 *Photobacterium 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.

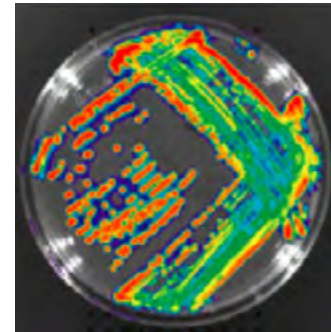
BACTERIUM	PARENTAL STRAIN	CAT. NUMBER
IVISbrite <i>Escherichia coli</i> Xen14	EPEC WS2572	119223
IVISbrite <i>Listeria monocytogenes</i> Xen19	ATCC 23074	119237
IVISbrite <i>Pseudomonas aeruginosa</i> Xen5	ATCC 19660	119228
IVISbrite <i>Pseudomonas aeruginosa</i> Xen41	PA01	119229
IVISbrite <i>Shigella dysenteriae</i> Xen27	88A6205 Clinical isolate	119231
IVISbrite <i>Proteus mirabilis</i> Xen44	ATCC 51286	119236
IVISbrite <i>Salmonella typhimurium</i> Xen33	FDA1189	119235
IVISbrite <i>Yersinia enterocolitica</i> Xen24	91A1854 Clinical isolate	119232
IVISbrite <i>Yersinia enterocolitica</i> Xen25	WS2589	119233
IVISbrite <i>Staphylococcus aureus</i> Xen8.1	8325-4	119239
IVISbrite <i>Staphylococcus aureus</i> Xen29	ATCC 12600	119240
IVISbrite <i>Staphylococcus aureus</i> Xen31	ATCC 33591	119242
IVISbrite <i>Staphylococcus aureus</i> Xen36	ATCC 49525	119243
IVISbrite <i>Staphylococcus aureus</i> Xen40	UAMS-1	119244



Real-time non-invasive imaging of IVISbrite *Proteus mirabilis* Xen44 migration of UTI infection from the bladder to the kidney. Imaged using IVIS Spectrum system.



IVISbrite *Pseudomonas aeruginosa* Xen5 biofilm infection. Imaged using the IVIS Spectrum.



IVISbrite *Pseudomonas aeruginosa* Xen5 imaged on IVIS Spectrum.

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## VesselVue® MICROBUBBLE CONTRAST AGENT

# Visualize Microvasculature

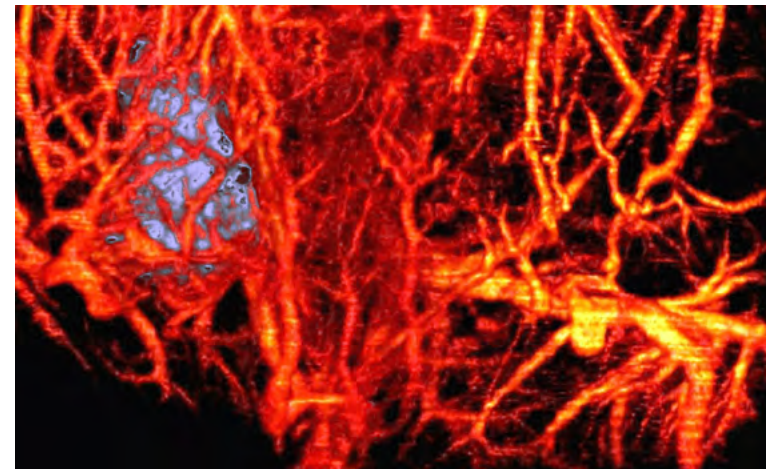
Contrast-enhanced ultrasound is a technique that uses microbubble-based contrast agent to improve the echogenicity of blood which in turn enhances and aids in the visualization of large vessels and tissue vascularity.

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

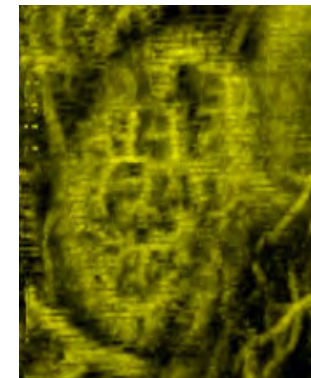
VesselVue microbubble agent, when used with an ultrasound system with a contrast enhanced imaging mode such as Acoustic Angiography on Revvity's Vega® system, enables high-sensitivity imaging of microvasculature in tumors and organs and can be used to evaluate angiogenesis or explore therapy response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

### VesselVue microbubble contrast agent is available in a p-formulation to suit your applications

CONTRAST AGENT	PRODUCT DESCRIPTION	CAT. NUMBER
VesselVue P-Formulation (Polydisperse)	Ideal for acoustic angiography and general imaging applications <ul style="list-style-type: none"> <li>■ Wider size distribution</li> <li>■ Smaller mean diameter</li> <li>■ Requires activation using VesselVue Microbubble Mixer (sold separately)</li> </ul>	P-4007001



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



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## IN VIVO IMAGING SYSTEMS

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

Optical	Optical	MicroCT	MicroCT	Ultrasound
 <p><b>IVIS® Lumina Series III</b></p> <ul style="list-style-type: none"> <li>■ 2D optical imaging</li> <li>■ Imaging up to 5 mice</li> <li>■ Optional integrated x-ray</li> </ul>	 <p><b>IVIS® Lumina S5 &amp; X5</b></p> <ul style="list-style-type: none"> <li>■ 2D optical imaging</li> <li>■ Imaging of up to 10 mice using optional manifold</li> <li>■ Optional integrated high-resolution x-ray</li> <li>■ Optional Smart accessories to streamline imaging workflow</li> <li>■ MVI-2 for automated 360 degree imaging</li> </ul>	 <p><b>IVIS® Spectrum 2 Series</b></p> <ul style="list-style-type: none"> <li>■ 2D and 3D optical imaging</li> <li>■ Imaging of up to 10 mice using optional manifold</li> <li>■ Fully automated, one-click co-registration with IVIS SpectrumCT</li> <li>■ Seamlessly co-register 3D optical and hi-res microCT data</li> <li>■ Two powerful modes of fluorescence excitation—epi- and trans-illumination</li> </ul>	 <p><b>Quantum GX3</b></p> <ul style="list-style-type: none"> <li>■ High spatial resolution</li> <li>■ Low dose microCT for longitudinal imaging</li> <li>■ Step and continuous imaging modes</li> <li>■ Cardiac and respiratory gating</li> </ul>	 <p><b>Vega®</b></p> <ul style="list-style-type: none"> <li>■ Automated, hands-free</li> <li>■ High-throughput 3 mice imaging</li> <li>■ Scan times in &lt; 1 minute</li> <li>■ Whole body field of view</li> <li>■ Multiple 3D imaging modes                             <ul style="list-style-type: none"> <li>■ Elastography (tissue stiffness)</li> <li>■ B-mode (soft tissue imaging)</li> <li>■ 4D B-mode/M-mode (cardiac imaging)</li> <li>■ Acoustic angiography (microvessel networks)</li> </ul> </li> </ul>

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# The support you need to achieve your research goals



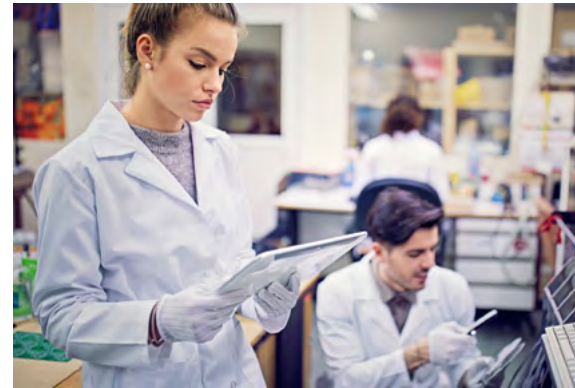
## Application Support

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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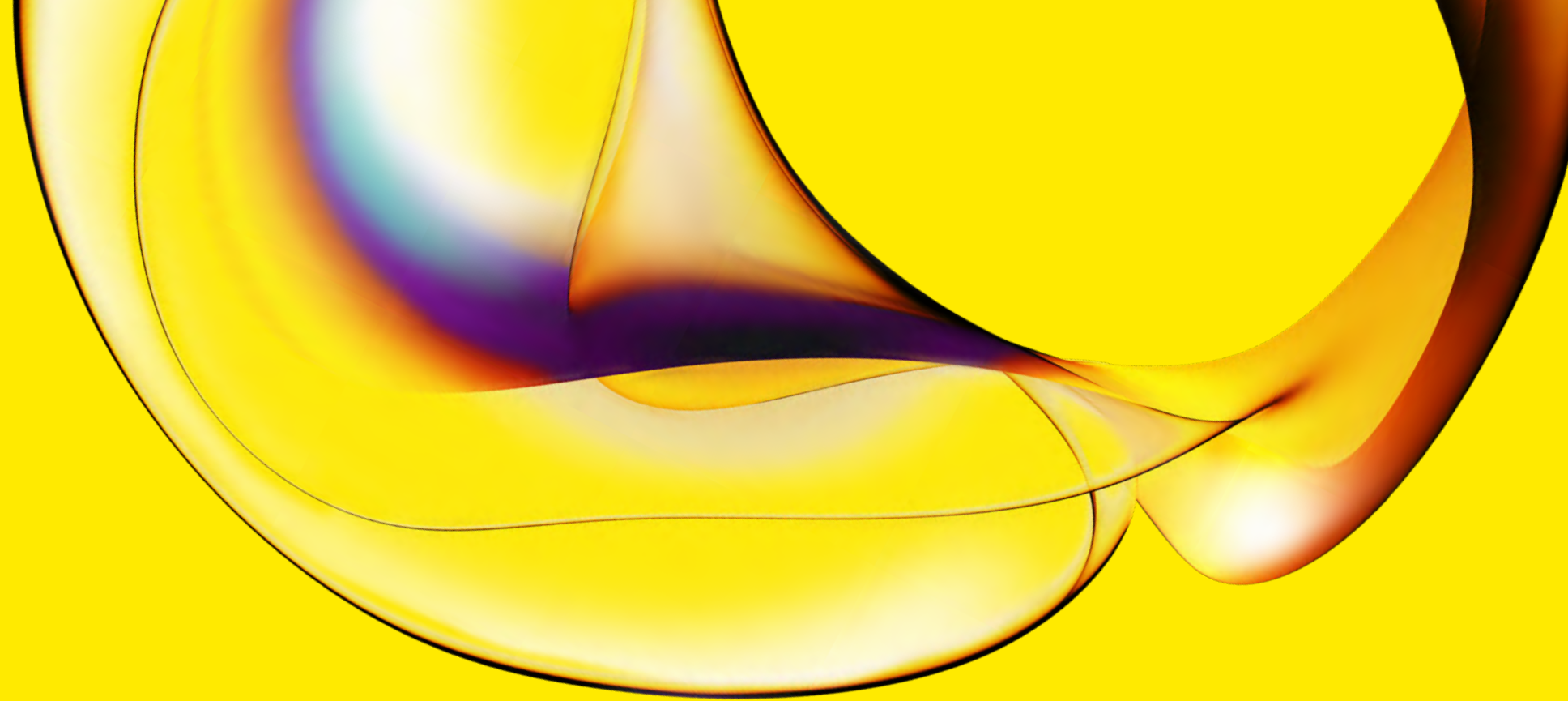
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revvity



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