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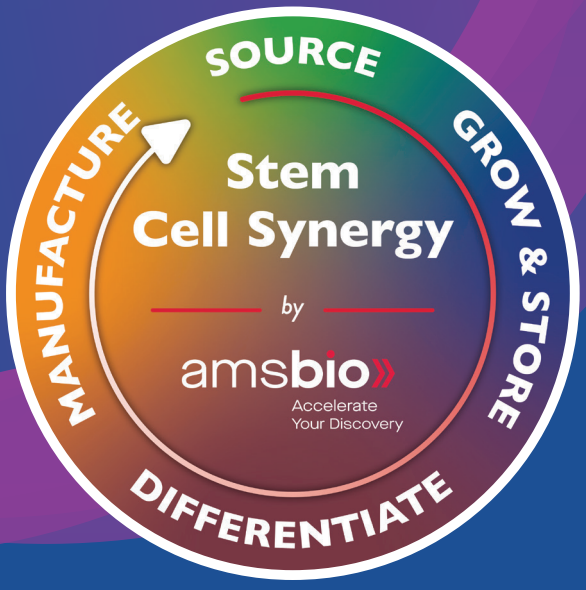
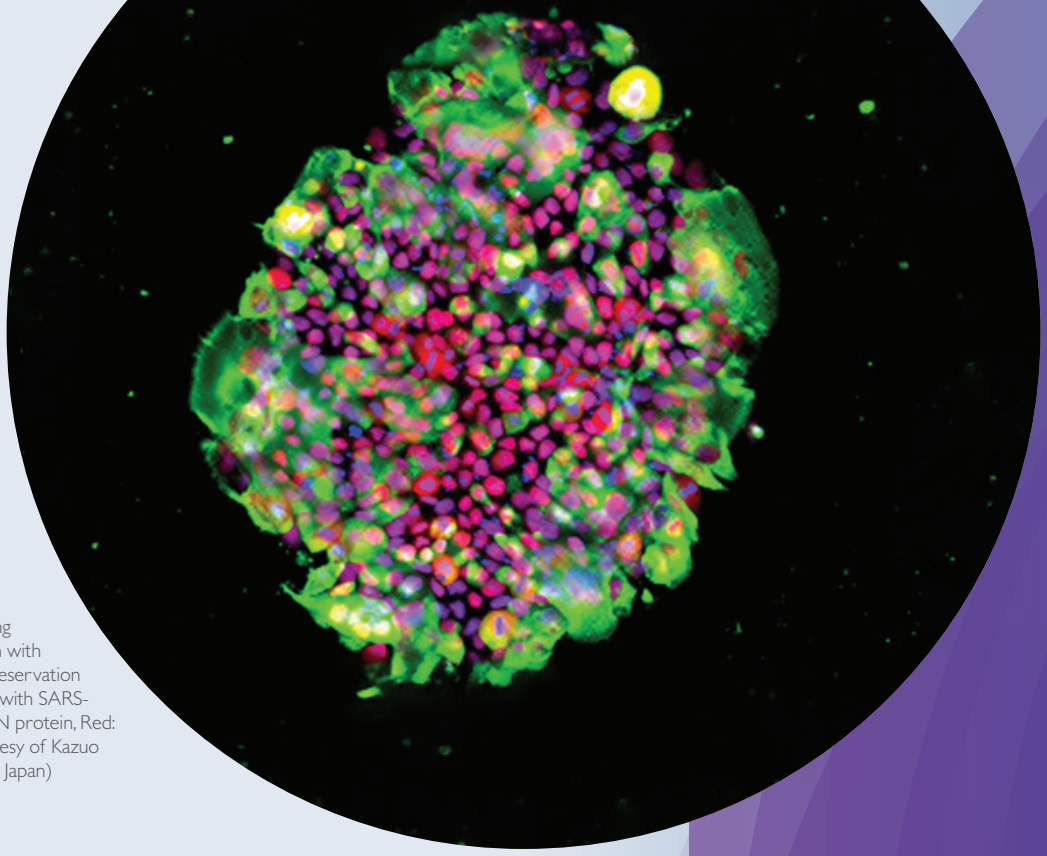
Stem Cells

STEM CELL SYNERGY BY AMSBIO

Your comprehensive answer to seamless stem cell research





Staining images of ACE2-expressing iPS cells grown in StemFit medium with iMatrix-511 as ECM (after cryopreservation in STEM CELLBANKER) infected with SARS-CoV-2 virus Green: SARS-CoV-2 N protein, Red: OCT3/4, Blue: DAPI. Images courtesy of Kazuo Takayama (CiRA, Kyoto University, Japan)

The AMSBIO Expanded Stem Cell Synergy Solutions

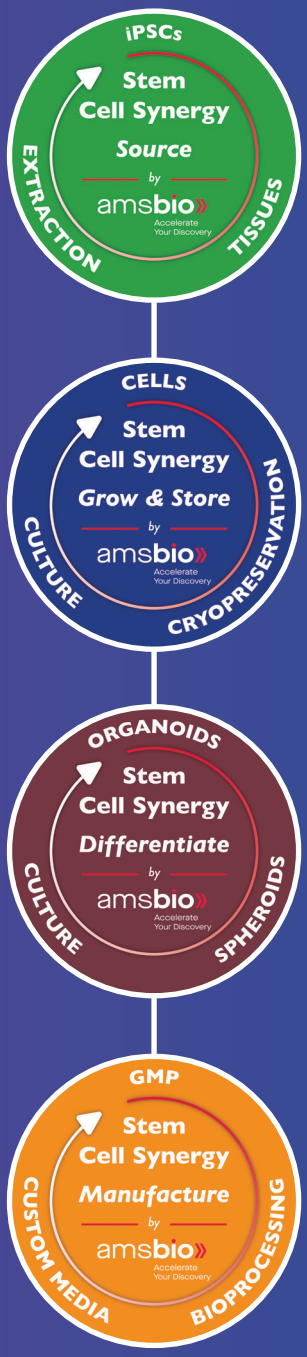
Simplifying the complex landscape of stem cell research

Stem cells are an indispensable tool in pharmaceutical research and development and the manufacturing of biotherapeutics, with numerous applications for disease treatment and endless possibilities in the field of regenerative medicine.

However, stem cell research can be costly and complex. Projects often require multiple different products, typically sourced from a range of providers, adding time, complexity, and cost during testing and validation. Many early-stage solutions are also less defined, with components that can introduce unwanted variability and ultimately bring challenges when scaling up.

That's why we created the AMSBIO Expanded Stem Cell Synergy Solutions portfolio: a one-stop shop for all of your stem cell research needs. Comprising an extensive range of GMP or GMP-equivalent products that are fully-defined and designed to work seamlessly together, the portfolio covers the entire stem cell workflow from start to finish.

Our Expanded Stem Cell Synergy Solutions are your comprehensive answer to seamless stem cell research. Our extensive portfolio covers the entire stem cell workflow, from sourcing, growing and storing, differentiating, and manufacturing.



A diverse array of stem cell sources, including readily available iPSC lines, complemented by user-friendly reprogramming kits for iPSC generation.

Everything you need for stem cell culture with superior expansion rates whilst maintaining genetic stability, as well as dependable solutions for long-term cryopreservation.

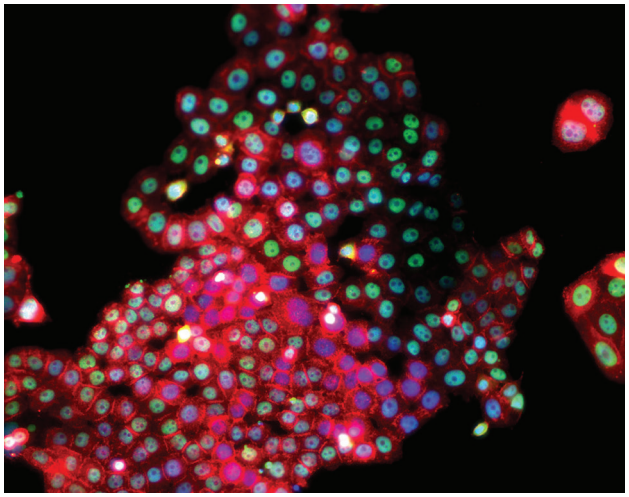
Our carefully curated suite of products designed to streamline your stem cell differentiation process and ensure reliable outcomes every time.

Seamlessly transition your research into manufacturing with our comprehensive range of GMP-compliant products and services.

Source

Your one-stop shop for sourcing stem cells

Our Source range is a comprehensive suite of products and services to meet all your stem cell sourcing needs. From fresh tissues to custom iPSC generation, we have you covered.



Immunocytochemical analysis of primary breast cancer cells in vitro. EGFR expression (red signal) a d TP53 nuclear accumulation (green signal); DAPI (blue signal).

Fresh Tissues from the Biorepository

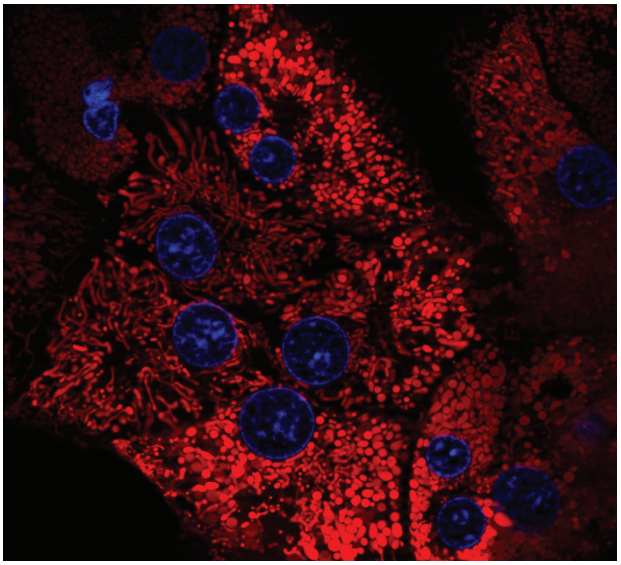
The AMSBIO biorepository houses an extensive array of fresh tissues, ready to serve as the primary source for isolating stem cells. We also have a collection of dissociated tumor cells, which are perfect for reprogramming into iPSCs.

- Strict quality control measures.
- Ethically sourced and IRB-approved tissues.
- AMSBIO also offers a custom tissue procurement service to assist you in acquiring specific tissues for your investigations.

Collagenases for Cell Isolation

Our Collagenase NB and Neutral Protease NB Enzymes are the ideal choice for isolating stem cells from primary sources, including tissues from our biorepository.

- Provide reliable and gentle tissue dissociation with tissue-specific protocols optimized for viable stem cell isolation.
- Dependable batch-to-batch consistency.
- Isolate high yields of viable cells.
- Available in research grade, clinical grade, and animal-free options.



Rat hepatocytes isolated using Collagenase NB 4G (Proved Grade): mitochondria stained with TMRM (red), nuclei stained with Hoechst 33342 (blue). Image courtesy of Dr. Pless, University Essen (Germany)

iPSC Reprogramming Kits

For researchers who want to generate their own iPSCs from specific donors or cell types, we provide reprogramming kits that contain all the necessary components and protocols.

- StemRNA™ 3rd Gen Reprogramming Kit safely and efficiently reprograms a broad range of somatic cell types to iPSCs.
- Fast, streamlined protocol for high quality iPSC generation.
- Synthetic mRNA for iPSC generation is pre-made, highly purified, and ready-to-use.
- High efficiency, non-integrating reprogramming.

High-sensitivity mycoplasma testing

Looking for high-sensitivity mycoplasma testing that complies with ISSCR publication standards? Choose MycoScope™ PCR Mycoplasma Detection Kit from AMSBIO!

With high-sensitivity detection, rapid results, and compatibility with existing PCR setups, this kit simplifies lab workflows, reduces the risk of contamination spread, and saves valuable time and resources.

Ready-To-Use iPSCs

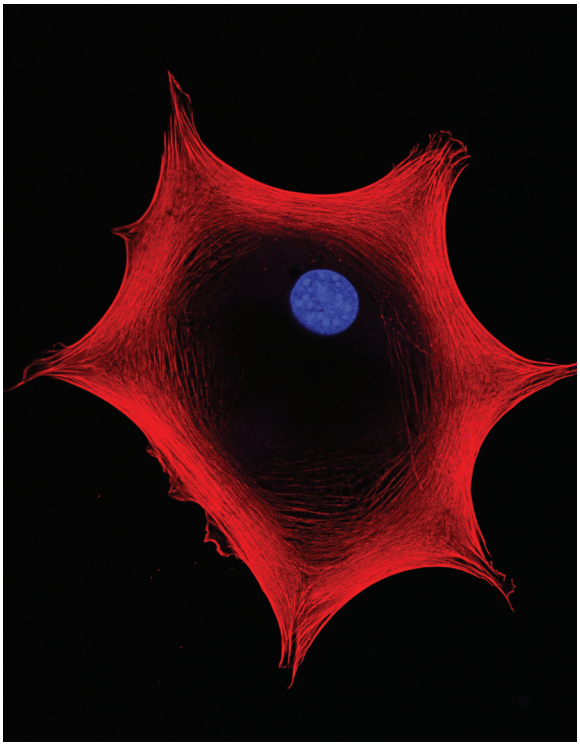
If you need a convenient and reliable source of iPSCs, we carry a comprehensive selection of iPSC lines.

- Meticulously characterized and validated to ensure their pluripotency, genetic stability, and differentiation potential.
- iPSCs are derived from ethically obtained sources, ensuring that their use complies with stringent guidelines and regulations.
- Our iPSCs are fully reprogrammed and ready to be differentiated making them a versatile tool for research and clinical applications.

The AMSBIO Custom iPSC Generation Service

We offer a custom iPSC service to generate iPSCs specific to your needs. Our service allows you to obtain iPSCs derived from your desired cell type, disease model, or genetic background.

Get in touch to learn more about our custom iPSC generation service.



Confocal microscopy image of a quiescent pluripotent stem cell with cytoskeletal protein actin in red, nucleus in blue.

Grow & Store

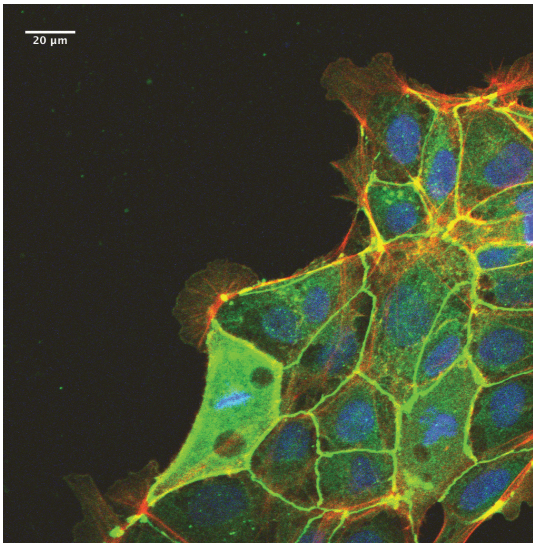
Streamlined cell culture for basic to clinical research

Our Grow & Store range of products offer feeder-free, animal-free, and chemically-defined solutions for cell culture, with GMP options available for clinical applications, such as in advanced therapies.

StemFit ® Feeder-Free Stem Cell Culture Media

StemFit® feeder-free stem cell culture media for iPS and ES cells **combines market-leading colony forming efficiency with reduced** media consumption to offer cost-effective colony expansion.

- Weekend free culture, requiring fewer media changes.
- Animal-free and chemically-defined.
- Optimized for single cell passaging with rapid expansion rates.
- Maintains high genetic stability over multiple passages.
- Available in research and GMP formulations.



Human iPS cells grown on laminin-511 E8 (coated laminin concentration 0.4 micrograms/cm²: ZO-1, Beta-Actin and Objective lens; X40)

iMatrix-511 Recombinant Laminin E8 Fragments

iMatrix-511 is an innovative cell culture matrix compatible with a wide variety of cell types, and exceptionally well suited for pluripotent stem cells. This product is comprised of recombinant Laminin-511 E8 protein fragments.

- Sustains long term propagation of wide variety of cell types, especially pluripotent cells.
- Superior adhesion of human PSCs.
- Time-saving coating-free method.
- Superior for single cell cloning e.g. in CRISPR/Cas9 gene editing.

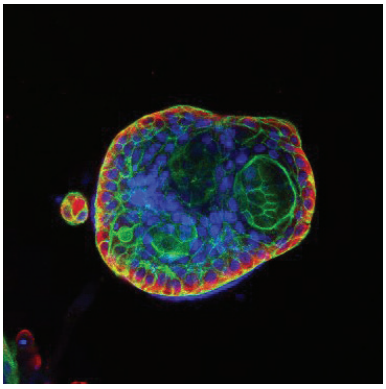
CELLBANKER ° Series Cryopreservation Media

The CELLBANKER® series of cell freezing media allows for the stable **long-term storage of ESCs, iPSCs, and other fragile cell types at -80°C or -196°C.**

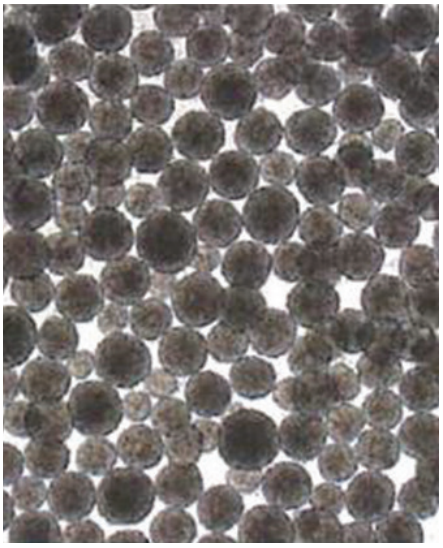
- High viability — hiPSCs showed 98.1% cell viability upon thawing.
- No programmed freezing or liquid nitrogen required.
- Research and GMP-grade available.
- Custom formulations, containers, and volumes available.

STEM-CELLBANKER ° EX cryopreservation solution

Our STEM-CELLBANKER® EX cryopreservation solution is an animal component-free, chemically-defined solution specifically designed for applications in advanced therapies, with ingredients already approved for intravenous administration and no requirement for washing upon delivery of the cell therapy product.



Human Airway Organoids frozen in CELLBANKER® 1 and imaged post-thaw. IF for DAPI, KRT5 (basal cell marker), Phalloidin (blue/red/green). Images courtesy of the Clevers Lab, Hubrecht Institute.



Human iPS cells (cell line 1231A3) grown in StemFit™ medium demonstrating the consistency of spheroid sizes after 4 days cultivation in the ABLE 3D Disposable Bioreactor at 40 rpm.

ABLE 3D Magnetic Stir and Disposable Bioreactor System for Stem Cell Culture

A 3D culture system designed specifically for the efficient and scalable cultivation of iPSC spheroid cultures, combining magnetic stirring and disposable bioreactors to facilitate the expansion and differentiation of stem cells.

- Bioreactor capacity of 30 mL, enabling 5 to 10-fold cell expansion (up to 5×10^7 cells).
- Typical growth of 200-300 µm spheroids.
- Compatible with StemFit media and iMatrix-511 recombinant ECM for iPSC culture and expansion.

Detachin™ Cell Detachment Solution

Gentle and rapid detachment of in vitro cultured cells

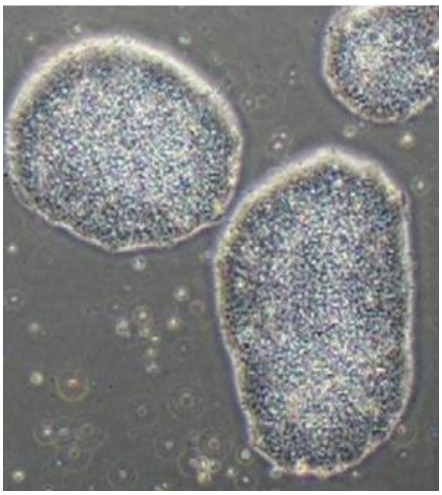
Detachin™ Cell Detachment Solution is a superior alternative to Trypsin/EDTA for gently detaching adherent cells from in vitro growth vessels.

- Provides quick, gentle, and effective detachment of a wide variety of adherent cells, including primary cells, from all known tissue culture plastic ware.
- Contains protease and collagenase activities in an isotonic, phosphate buffer solution with EDTA.
- No mammalian or bacterial by-products.
- Preserves epitopes for flow cytometry.

Differentiate

Your streamlined solution to stem cell differentiation

Our Differentiate range is curated to work seamlessly together, ensuring streamlined and reliable differentiation outcomes every time. From essential growth factors and cell culture matrices to specialized differentiation kits, we provide everything you need to achieve your research goals.

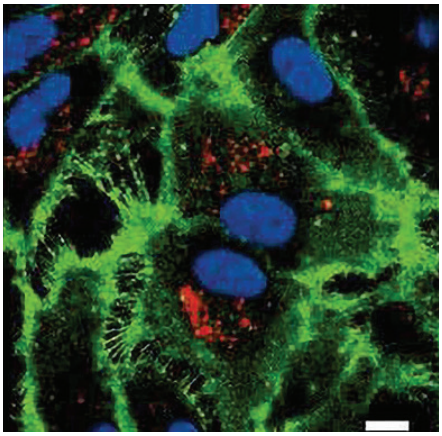


Human 201B7 iPSCs cultured on iMatrix Laminin-511 with StemFit® for 4 weeks without weekend feeding.

StemFit ® for Differentiation

StemFit® for Differentiation is a chemically-defined and animal component-free supplement for differentiating ESCs and iPSCs into various lineages, compatible with a range of different induction factors and cytokines.

- Can be combined with StemFit ® culture media and iMatrix Recombinant Laminin E8 Fragments for a streamlined workflow.
- Highly consistent cell differentiation.
- Animal-origin free composition.
- Supports differentiation along ectoderm, mesoderm, or endoderm lineages.
- StemFit® for T-Cell Differentiation provides a controlled and reproducible approach to T cell generation using pluripotent stem cells.



Phenotypes of endothelial cells induced from pluripotent stem cells on iMatrix-411 coated plate. Marked by acetyl-LDL uptake (red), CD31 (green) expression, and nuclear staining (blue). Scale bar: 10 um.

iMatrix Laminin Isoforms

Our iMatrix Recombinant Laminin E8 Fragments can be used in cell culture to efficiently induce differentiation of pluripotent stem cells into various lineages.

- Highly purified and refined laminin E8 fragments ensuring consistent and reliable results.
- Comprehensive range of isoforms, including laminin-111, laminin-332, laminin-411, laminin-221 and laminin-511, for differentiation into an array of lineages.
- Use in combination with StemFit Purotein ® and StemFit® Culture Media for the ultimate differentiation solution.

AMSBIO Small Molecules

Our diverse range of small molecules can be used across the entire stem cell workflow, with applications ranging from reprogramming cells to promoting self-renewal and differentiation.

Explore the range of small molecules at our website or get in touch to learn more.

Expanded Stem Cell Synergy Products in World-Leading Research

Modelling SARS-COV-2 infection using ACE2-expressing iPS cells

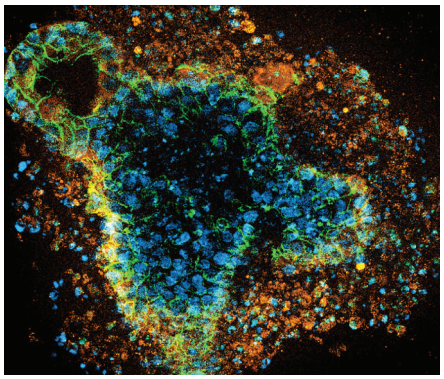
Dr. Kazuo Takayama's group at Kyoto University have utilized Stem Cell Synergy products to reproduce the life cycle of the SARS-COV-2 virus in previously uninfectable human iPS cells by overexpressing the virus's binding site, ACE2.

Differences in infection efficiency were observed between the ACE2-iPS cells donated from 8 different individuals, such as increased viral replication in male-derived cells. It is now possible to investigate other individual differences, such as genetic background, race, and blood type.

The ACE2-iPSC model confirmed the efficacy of COVID-19 treatments such as Remdesivir, indicating that these ACE2-iPS cells could be used to evaluate future COVID-19 drug candidates.

"Although many cells are required for COVID-19 drug evaluation, iPS cells cultured with StemFit and iMatrix have a high replication capacity, so that sufficient cell numbers can easily be prepared – and can easily be cryopreserved as required using STEM-CELLBANKER."

Dr. Kazuo Takayama.



Patient-derived colorectal cancer organoids grown in Extragel Matrix. Immunofluorescence image stained with DAPI (blue), LGR5 (red/orange), and ECAD (green). Courtesy of ScreenIn3D.

3D Culture Matrices

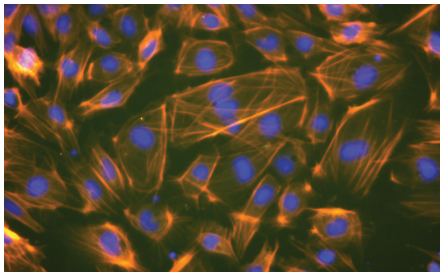
We offer both MatriMix Hydrogel and Extragel Matrix, versatile 3D culture substrates for stem cell culture, enabling multi-organ organoid formation and drug screening.

MatriMix

- Fully defined hydrogel composed of medical grade collagen, laminin-511 E8 fragments, and hyaluronic acid.
- Regulatory friendly.
- Adjustable ECM components.
- Compatible with a wide variety of cell types, including PSCs and adult stem cells.

Extragel

- Like-for-like replacement for Matrigel™, Geltrex™, and Cultrex™ BME.
- Composed mainly of laminin, collagen IV, heparan sulfate proteoglycans, and growth factors such as EGF, PDGF, NGF, FGF-2, TGF-ß and IGF.
- Stringent quality control.
- High lot-to-lot consistency.

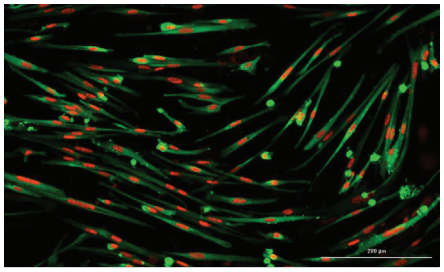


Immunostaining image of iPSC derived vascular smooth muscle in which our StemFit Purotein Activin A has been used for differentiation. Image courtesy of Dr. Toyohara (Tohoku University, Sendai, Japan)

StemFit Purotein ® Recombinant Proteins

Our StemFit® Purotein Recombinant Proteins are a range of easy-to-use animal origin-free growth factors and cytokines, enabling precise differentiation of ESCs and iPSCs into a variety of lineages.

- Range includes Activin A, bFGF, BMP-4, KGF (FGF-7), SCF and VEGF proteins.
- Ready-to-use frozen formulation, no reconstitution necessary.
- High lot-to-lot consistency.
- High purity and high performance.
- Available in research and clinical grade formats, and PMDA approved for cell therapy.



Skeletal muscle precursor cells (stage II and III) produced with the Skeletal Muscle Differentiation Kit (courtesy: Douglas Smith - Doles Lab) ; 262B: Schematic of muscle generation in 3 easy steps

Differentiation kits

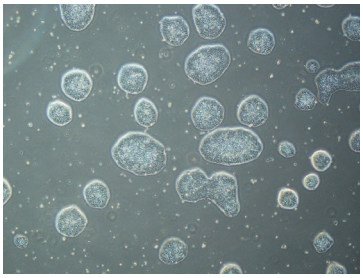
Our differentiation kits streamline your approach to generating mature specialized cells from iPSCs with high efficiency and reduced time-scales. We have kits for generating multiple different mature cell types, including:

- Skeletal muscle differentiation.
- Neuronal differentiation — GABAergic, Cholinergic, and Dopaminergic.

Manufacture

Our GMP-grade range for regulatory-compliant production

Our comprehensive Manufacture range of GMP-grade products caters to every stage of your process, ensuring a regulatory-compliant journey for your advanced therapy medicinal product (ATMP) manufacturing.



Colonies of healthy, undifferentiated iPSCs grown using StemFit Basic04 CT. Note that the colonies are round with tightly packed iPSCs and well-defined edges.

StemFit®

StemFit® is a GMP grade, animal-free, chemically defined media for feeder-free culture of iPSCs and ESCs. StemFit® has over 100 fold higher expansion rate than that other culture medias.

- Superior colony forming efficiency from a single clone.
- Allows weekend-free cell culture, reducing labour costs.
- More cost-effective with reduced media consumption.
- Offers reproducible growth rates and easy transition from feeder cells.
- Compatible with ABLE Bioreactor System for improved productivity, sustainability, and scalability.

iMatrix-511 MG

iMatrix-511 MG is a clinical-grade recombinant laminin E8 fragment, an extracellular matrix protein crucial for cell adhesion. It is used in cell culture to efficiently expand colonies and can be combined with StemFit® GMP cell culture media to create an ideal environment for growing PSCs for manufacturing purposes.

- Highly purified and refined laminin E8 fragments ensuring consistent and reliable results.
- Time-saving coating-free method, reducing labour and increasing efficiency.
- Sustains long-term propagation of a wide variety of cell types, especially pluripotent cells.

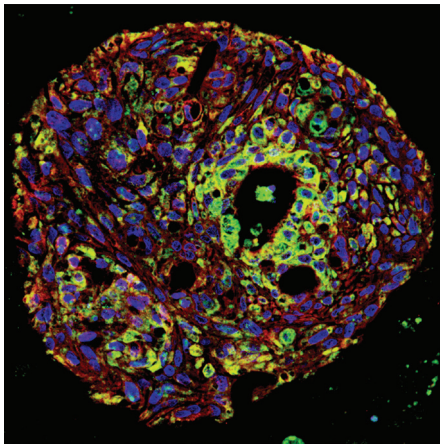
AOF StemFit Purotein® Recombinant Proteins

Our AOF StemFit Purotein® Recombinant Proteins are available in GMP formats and are the superior choice for full control over differentiation during the manufacturing process.

Collagenase and Neutral Protease Enzymes

Our GMP-grade collagenase and neutral protease enzymes deliver efficient tissue dissociation and stem cell isolation. With their exceptional safety profile, they can reduce regulatory hurdles for commercial manufacturing.

- GMP-grade animal-free enzymes available, guarantees no risk of cross-contamination with animal-derived materials.
- High performance and reproducibility in manufacturing processes.
- Isolation of a wide range of cells, including hepatocytes, islets of Langerhans, and tumor cells.



Human bronchial organoids after cryopreservation in STEM CELLBANKER Red: acetylated a-tubulin, green: SARS-CoV-2-N protein, blue: DAPI. Images courtesy of Kazuo Takayama (CiRA, Kyoto University, Japan)

STEM-CELLBANKER ° Stem Cell Freezing Media

STEM-CELLBANKER® is a GMP-grade, chemically-defined, and animal component free cryopreservation media that ensures long-term cell storage of up to 10 years with high cell viability and recovery post-thaw.

- Maintains cell pluripotency, normal karyotype, and proliferation ability post-thaw.
- Suitable for cell, tissue, and organoid cryopreservation.
- No programmed freezer or liquid nitrogen required.
- Manufactured in compliance with JPN, EU, US, and PIC/S GMP guidelines.
- FDA Drug Master File registered.
- Can be combined with STEM-CELLBANKER® EX to eliminate the need for a wash step after thawing.

What is GMP?

GMP encompasses all processes involved in the manufacture of a product, including quality control and assurance, documentation, employee training, and the design of the manufacturing facility. The final outcome is a reliable, high-quality product with low lot-to-lot variability, which has been stored and labelled correctly.

For more information on GMP regulations, manufacturing practices, and quality control procedures, check out our AMSBIO Guide to GMP.

LET US ACCELERATE YOUR DISCOVERY

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NEED SOMETHING FURTHER?

BIOSPECIMENS
Enhancing the development of specimens that are reliable, relevant, and reproducible.

3D CELL CULTURE:
Aiding in the creation of cultures that are relevant, robust and reproducible.

STEM CELLS
Extensive range of ready-to-use and custom kits for drug discovery and biomedical research.

KITS AND ASSAYS:
Extensive range of ready-to-use and custom kits for drug discovery and biomedical research.

GLYCOBIOLOGY:
Specialized products and expertise in glycobiology research, vital for cellular biology and drug discovery.

CUSTOM SERVICES:
Comprehensive suite of customizable services for advanced research and clinical applications.

AMS BIOTECHNOLOGY (EUROPE) LTD
UK & REST OF THE WORLD
184 Park Drive, Milton Park
Abingdon, OX14 4SE
T: +44 (0) 1235 828 200
F: +44 (0) 1235 820 482

AMSBIO LLC
USA & CANADA
1035 Cambridge Street,
Cambridge, MA 02141
T: +1 (617) 945-5033 or
+1 (800) 987-0985
F: +1 (617) 945-8218

AMS BIOTECHNOLOGY (EUROPE) LTD
SWITZERLAND
Via Lisano 3, (Cp.683)
Ch-6900 Messagno
T: +41 (0) 91 604 55 22
F: +41 (0) 91 605 17 85

AMSBIO EUROPE BV
EU
Berenkoog 41,
1822 BH Alkmaar,
Netherlands
T: +31 (0) 72 8080244
F: +31 (0) 72 8080142

amsbio.com