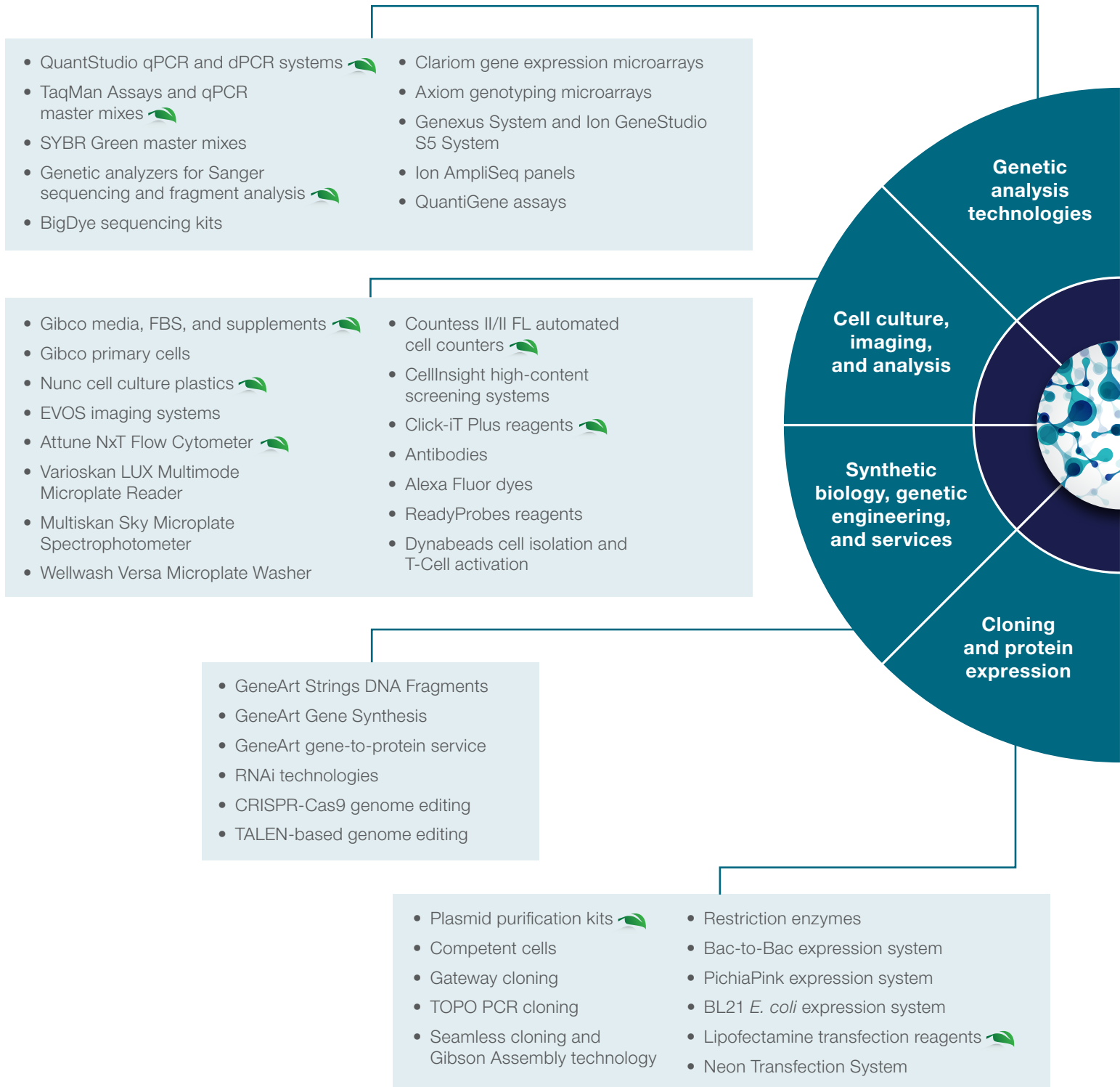


Lab checklist

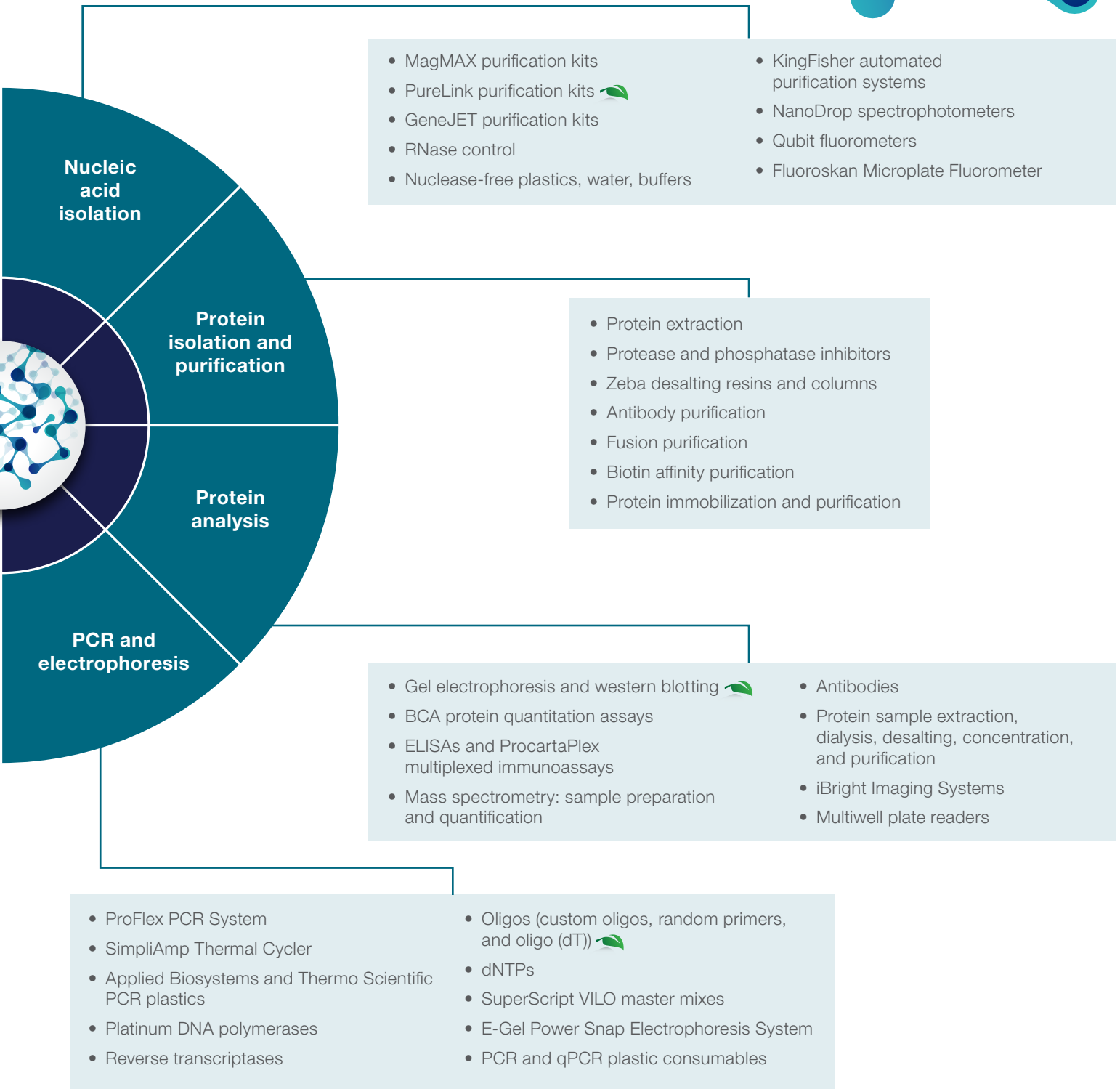
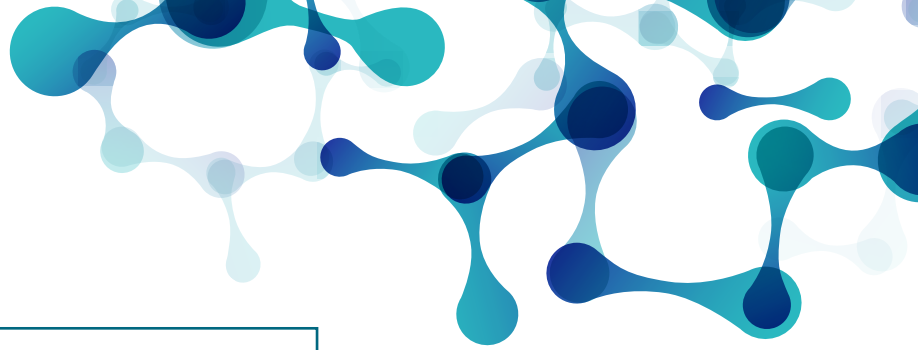
Overview of Thermo Scientific, Applied Biosystems, Invitrogen, Gibco, and Ion Torrent product portfolios

Optimized products for every step of your workflow



Greener product alternatives are available in these portfolios. To learn more, go to thermofisher.com/greeneralternatives.

Protein, RNA, cell, and DNA—we have you covered



Sample preparation: RNA and DNA isolation and purification and nucleic acid quantification

RNA extraction

- Invitrogen™ TRIzol™ Reagent
- Invitrogen™ PureLink™, GeneJET™, and silica spin columns
- Applied Biosystems™ MagMAX™ magnetic bead extraction kits
- Invitrogen™ Dynabeads™ magnetic beads
- Thermo Scientific™ KingFisher™ automated purification instrument

DNA extraction

- Organic reagents
- PureLink and GeneJET columns
- MagMAX magnetic bead extraction kits
- Dynabeads magnetic beads
- KingFisher automated purification instrument

Gel extraction and PCR clean up

Plasmid prep

- Mini
- Midi
- Maxi
- Giga

- Molecular grade
- Transfection grade (low-endotoxin)
- Advanced transfection grade (endotoxin-free)

Nucleic acid purification essentials

- Nuclease-free water
- Invitrogen™ RNaseZap™ RNase decontamination products
- Invitrogen™ RNAlater™ stabilization solution
- Nuclease-free tubes and tips
- Nuclease-free buffers and reagents

Nucleic acid quantification

- Plate-based assays
- Thermo Scientific™ Varioskan™ LUX Multimode Microplate Reader
- Thermo Scientific™ Fluoroskan™ Microplate Fluorometer
- Invitrogen™ Quant-iT™ assays (high-throughput)
- Thermo Scientific™ NanoDrop™ spectrophotometer

- Invitrogen™ Qubit™ 4 Fluorometer with Wi-Fi
- Invitrogen™ Qubit™ assays
- Invitrogen™ Qubit™ Flex Fluorometer

Recommended literature

- RNA reference guide: sample preparation and purification solutions
- DNA reference guide: sample preparation and purification solutions
- KingFisher Automated Purification Solution brochure
- KingFisher instruments guide
- Dynabeads magnetic beads guide



PCR, cloning, and nucleic acid electrophoresis



PCR

- Primers
- Reverse transcriptases

DNA polymerases

- Hot-start
- High-fidelity
- Long PCR
- Direct PCR

PCR plastics

Thermal cyclers

- 96-well
- 384-well
- Multiblock
- Automated

Nucleic acid electrophoresis

- Agarose
- Invitrogen™ E-Gel™ Power Snap Electrophoresis System
- Ladders

- Gel stains
- Buffers
- Loading dyes
- Invitrogen™ E-Gel™ gels
- UV/LED transilluminators

Cloning

- Vectors
- Restriction enzymes
- Invitrogen™ TOPO™ cloning kit
- Invitrogen™ Gateway™ cloning kit
- Invitrogen™ GeneArt™ Gibson Assembly® Cloning Kit
- Invitrogen™ GeneArt™ Strings™ DNA Fragments
- Invitrogen™ GeneArt™ Gene Synthesis

Molecular biology basics

- DNase-/RNase-free distilled water
- dNTPs
- DNase I

- Ultrapure water
- Invitrogen™ RNaseOUT™ Recombinant Ribonuclease Inhibitor

Recommended literature

- Molecular biology handbook
- Gene-to-protein handbook
- Cloning solutions brochure
- GeneArt Gene Synthesis Resource Guide
- TOPO PCR Cloning brochure
- E-Gel precast agarose gels brochure
- Rock the Clone brochure
- PCR/qPCR solutions brochure

Genetic analysis

- qPCR**
 - Applied Biosystems™ QuantStudio™ real-time PCR instruments
 - Applied Biosystems™ TaqMan® Assay products (individual assay tubes, 96-well array plates, 384-well array plates and cards, 3,072-well OpenArray™ Plates)
 - Applied Biosystems™ TaqMan® chemistry
 - Applied Biosystems™ SYBR™ Green chemistry
 - Applied Biosystems™ MicroAmp™ PCR plastics
- Invitrogen™ QuantiGene™ assays**
 - Singleplex
 - Multiplex
- dPCR**
 - Applied Biosystems™ QuantStudio™ 3D Digital PCR System
- qPCR research applications**
 - Gene expression analysis
 - microRNA analysis
- SNP genotyping
- Copy number variation (CNV) analysis
- Drug metabolism analysis
- Mutation detection analysis
- Allele quantification
- Pathogen detection
- Capillary electrophoresis**
 - Sanger sequencing
 - Fragment analysis
 - Applied Biosystems™ genetic analyzers
- Ion Torrent™ next-generation sequencing**
 - DNA sequencing (exome)
 - Targeted RNA sequencing (transcriptome)
 - Ion Torrent™ Genexus™ System and Ion GeneStudio™ S5 System
- Invitrogen™ Collibri™ NGS products for Illumina™ systems**
 - Whole-genome library prep kits
 - Whole-transcriptome library prep kits
 - 3' mRNA library prep kits
 - qPCR library quantification kit
- Sanger sequencing and NGS research applications**
 - Oncology/immuno-oncology
 - Plasmid construction
 - Variant discovery and validation
 - Reproductive health
 - Gene editing verification
 - Cell line authentication
 - Inherited diseases
 - Genotyping by sequencing
 - Agrigenomics
 - Human identification
 - Microbial/metagenomic research
- Instrument services and support**
 - Instrument service plans
 - Compliance services
 - Education services



Applied Biosystems™ QuantStudio™ 7 Pro Real-Time PCR System, Applied Biosystems™ SeqStudio™ Genetic Analyzer, and Ion GeneStudio™ S5 System.

Recommended literature

- Real-time PCR handbook
- PCR/qPCR solutions brochure
- Sanger sequencing guide
- DNA fragment analysis by capillary electrophoresis user guide
- Ion Torrent™ NGS solutions brochure
- OncoPrint™ Solutions brochure
- Collibri NGS library preparation for Illumina systems
- Services and support brochure

Transfection and protein expression

- Protein expression**
 - Mammalian
 - Bacterial
 - Insect
 - Algae
 - Yeast
 - Cell-free
- Transfection**
 - Invitrogen™ Neon™ Transfection System
 - Invitrogen™ Lipofectamine™ 3000 reagent (for DNA plasmid delivery)
 - Invitrogen™ Lipofectamine™ RNAiMAX reagent (for siRNA or miRNA delivery)
 - Invitrogen™ Lipofectamine™ MessengerMAX™ reagent (for mRNA delivery)
 - Invitrogen™ Lipofectamine™ CRISPRMAX™ reagent (for CRISPR-Cas9 protein delivery)
- Project information**
 - Cell info _____
- Sample type**
 - Adherent cells
 - Suspension cells
- Details** _____

Recommended literature

- Protein expression handbook
- Transfection and genome engineering handbook

Cell culture, imaging, and analysis

Cell culture media and reagents

- Classical media
- Stem cell media
- Cell types
 - Feeder-free pluripotent stem cells
 - Pluripotent stem cells
 - Hematopoietic stem cells
 - Mesenchymal stem cells
- Supplements, e.g., Gibco™ GlutaMAX™ supplement
 - _____
- Extracellular matrices
 - _____
- Dissociation reagents, e.g., Gibco™ TrypLE™ dissociation reagent
 - _____
- FBS
 - Regular
 - Heat-inactivated
 - Specialty
- Invitrogen™ Countess™ II or II FL Automated Cell Counter
- Trypan blue solution
- Invitrogen™ LIVE/DEAD™ stains

Cell culture plastics

- Flasks
 - 25 cm²
 - 75 cm²
 - 175 cm²
 - 225 cm²
 - 500 cm²
 - Vent or filter cap
 - Surface: _____
- Dishes
 - 4-well
 - 6-well
 - 12-well
 - 24-well
 - 48-well
 - 96-well
 - Surface: _____

Specialty cell cultureware

- Chamber slides
 - Cell culture inserts
 - Glass-bottom dishes
- Plates
 - 35 mm
 - 60 mm
 - 90 mm

- 100 mm
- 150 mm
- Surface: _____

Cell culture accessories

- 15 mL conical tube
- Screw cap or flip cap
- 50 mL conical tube
- Screw cap or flip cap
- Serological pipettes
- Volume(s): _____

Cell therapy

- Application: _____

Cell type

- 1. _____
- 2. _____
- 3. _____

Flow cytometry

- Invitrogen™ Attune™ NxT Flow Cytometer
- Invitrogen™ CytKick™ Max Autosampler
- Conjugated antibodies
- Apoptosis assays
- Cell cycle assays
- RNA detection assays
- Calibration and size reference beads
- Compensation beads
- Cell counting beads
- Cell viability assays

Microscopy

- Bright-field microscope (Invitrogen™ EVOS™ XL Core Cell Imaging System)
- Fluorescence microscope (Invitrogen™ FLoid™, EVOS™ M5000, or EVOS™ M7000 Cell Imaging Systems)
 - _____
- Antibodies
- Antibody and protein labeling
- Immunohistochemistry
- Fluorescence *in situ* hybridization (FISH)
- Organelle and cytoskeletal staining
- Cell health and viability staining
- Glutathione detection
- Imaging of calcium and other ions
- Tyramide signal amplification (TSA)
- Invitrogen™ ReadyProbes™ reagents
- Antifades and mountants



High-content screening

- Application: _____
- Thermo Scientific™ CellInsight™ CX5 platform
- Thermo Scientific™ CellInsight™ CX7 LED or CX7 LZR platform

Varioskan LUX Multimode Microplate Reader

- Application: _____

Multiskan Sky Microplate Spectrophotometer

- Application: _____

Countess II or II FL Automated Cell Counter

- Application: _____

Recommended literature

- The Molecular Probes™ Handbook—a guide to fluorescent probes and labeling technologies
- Flow cytometry capabilities guide
- Cell culture handbook



Protein biology

Purification and isolation

- Cell lysis and fractionation
- Organelle isolation
- Subcellular fractionation
- Protease and phosphatase inhibitors
- Detergents
- Protein solubilization, specific to sample
- Protein purification
- Immunoprecipitation
- Resins
- Dialysis cassettes
- Desalting columns
- Concentrators
- Biotin, crosslinker, and dye removal
- Endotoxin detection and removal

Protein gel electrophoresis

- Power supplies
- Electrophoresis tanks (mini and midi)
- Mini gels
- Midi gels
- High-throughput
- Gels
 - Pour-your-own
 - Precast
 - Tris-glycine
 - Bis-Tris
 - Tris-acetate
 - Tricine
- Gel standards and ladders
- Gel stains
- Total protein labeling for western blot normalization

Western blotting

- Transfer
 - Wet transfer
 - Semi-dry
 - Invitrogen™ Power Blotter System
 - Invitrogen™ iBlot™ 2 Gel Transfer Device
 - Membranes
 - Nitrocellulose (NC)
 - Polyvinylidene fluoride (PVDF)
- Detection
 - Invitrogen™ iBind™ devices
 - Conjugates and probes
 - Antibodies
 - Blocking buffers and milk
 - ECL substrates
 - Chemiluminescent
 - Fluorescent
 - Chromogenic
 - Invitrogen™ iBright™ Imaging Systems

Mass spectrometry

- Sample preparation
- Protein and/or peptide quantitation
- SILAC metabolic labelling
- Thermo Scientific™ Tandem Mass Tag™ (TMT) reagents
- Instrument calibration
- Plasma protein binding assays

Assays and analysis

- Plate readers
- Thermo Scientific™ Multiskan™ FC Microplate Photometer
- Thermo Scientific™ Multiskan™ Sky Microplate Spectrophotometer
- Fluoroskan Microplate Fluorometer

- Thermo Scientific™ Luminoskan™ Microplate Luminometer

- Varioskan LUX Multimode Microplate Reader

- Luminex® instruments

- Invitrogen™ ProcartaPlex™ multiplex assays

- ELISAs

- Coated ELISA

- Uncoated ELISA kit

- Do-it-yourself solution

- Buffers

- Substrates

- Enzyme conjugates

- BCA protein concentration assays

- Bradford protein concentration assays

- Protein microarrays

- Protein ligation assay

- Invitrogen™ ProQuantum™ high-sensitivity immunoassays

- Reporter gene assays

- Protein and enzyme activity assays

- Protein interaction analysis

Recommended literature

- Cell and protein isolation technical handbook
- Thermo Scientific™ Pierce™ products for mass spectrometry sample preparation handbook
- Tools for protein research guide
- Western workflow overview brochure
- Protein prep overview brochure
- iBright Imaging Systems brochure

Laboratory equipment

- Benchtop centrifuges and rotors**
 - Microcentrifuges to general-purpose centrifuges
 - Thermo Scientific™ Fiberlite™ carbon fiber rotors
- Benchtop laboratory equipment**
 - Benchtop shakers
 - Hotplates and stirrers
 - Rockers, rotators, and mixers
 - Thermo Scientific™ Savant™ SpeedVac™ Vacuum Concentrators
 - Dry baths
- Biological safety cabinets and clean benches**
 - Thermo Scientific™ Herasafe™ 2030i Class II, A2 BSC
 - 1300 Series Class II, A2 BSC
 - 1500 Series Class II, B2 BSC
 - Thermo Scientific™ Heraguard™ ECO laminar flow hood
- CO₂ incubators and accessories**
 - Thermo Scientific™ Heracell™ VIOS 160i/250i CO₂ incubator
 - Thermo Scientific™ Forma™ Steri-Cult™ CO₂ incubator
 - Thermo Scientific™ Heracell™ 150i/240i CO₂ incubator
 - Thermo Scientific™ Forma™ Steri-Cycle™ CO₂ incubator
 - Thermo Scientific™ Forma™ water-jacketed CO₂ incubator
 - Thermo Scientific™ Large-Capacity Reach-in CO₂ incubator
 - Thermo Scientific™ Heracell™ VIOS 160i CO₂ incubator with Cell Locker™ System
- Constant temperature**
 - Thermo Scientific™ Heratherm™ microbiological incubators
 - Thermo Scientific™ Heratherm™ refrigerated incubators
 - Thermo Scientific™ Forma™ environmental chambers
 - Ovens and furnaces
- Floor centrifuges and rotors**
 - Thermo Scientific™ Sorvall™ LYNX Superspeed models
 - Thermo Scientific™ Sorvall™ WX+ Ultra-speed models
 - Large-capacity centrifuges
 - Low-speed centrifuges
 - Fiberlite carbon fiber rotors
- Orbital shakers**
 - Thermo Scientific™ Solaris™ open-air shakers
 - Thermo Scientific™ MaxQ™ incubated/refrigerated shakers
- Cryopreservation systems**
 - Thermo Scientific™ CryoMed™ Controlled-Rate Freezer
 - Thermo Scientific™ CryoPlus™ and CryoExtra™ storage systems
 - Thermo Scientific™ Locator™ storage, manual-fill LN₂ storage
- Laboratory refrigerators and freezers**
 - Single, double, and triple door refrigerators (4°C and 5°C)
 - Single and double door freezers (-30°C), auto defrost
 - Single door enzyme freezers, (-20°C), manual defrost
 - Undercounter refrigerators and freezers
- Ultra-low freezers, capacity from 300 to 700 boxes**
 - Thermo Scientific™ TSX series -80°C upright freezers
 - Thermo Scientific™ RDE series -40°C and -80°C upright freezers
 - 40°C and -80°C chest freezers
- Water baths, circulators, and chillers**
 - Thermo Scientific™ Precision™ water baths
 - Heated/refrigerated bath circulators
 - Immersion circulators
 - Laboratory and recirculating chillers
- Remote monitoring**
 - Thermo Scientific™ Smart-Vue™ wireless monitoring system
 - Thermo Scientific™ InSight asset management system
- Full-service support with Unity Lab Services**
 - Instrument and equipment installation, repair, and technical support
 - Service plans with 50% faster response time and 30% less downtime
 - Extended warranties
 - Preventive maintenance
 - Compliance and calibration services
 - Parts, consumables, software, and accessories
 - Asset and supply management

Water analysis and purification

- Water analysis instruments**
 - Thermo Scientific™ Orion™ benchtop and handheld meters
 - Electrodes, buffers, and solutions
 - Potentiometric titrators
 - Colorimetry, turbidity, and spectrophotometry
- Water purification**
 - Thermo Scientific™ Barnstead™ Type 1 Ultrapure Water Purification Systems
 - Thermo Scientific™ Barnstead™ Type 2 Pure Water Purification Systems
 - Reverse osmosis systems
 - Water stills



Laboratory plasticware and supplies

Pipettes

- Thermo Scientific™ F1-ClipTip™ Manual Pipettes
- Thermo Scientific™ E1-ClipTip™ Electronic Pipettes
- Thermo Scientific™ Finnpiquette™ F1 Manual Pipettes
- Thermo Scientific™ Finnpiquette™ F2 Manual Pipettes
- Thermo Scientific™ Finnpiquette™ Novus Electronic Pipettes
- Thermo Scientific™ S1 Pipette Filler

Pipette tips and accessories

- Thermo Scientific™ ClipTip™ Pipette Tips
- Thermo Scientific™ Finntip™ and Finntip™ Flex Pipette Tips
- Thermo Scientific™ ART™ Universal Pipette Tips
- Automation pipette tips
- Reservoirs

Dispensers

- Thermo Scientific™ Multidrop™ Combi Reagent Dispenser
- Thermo Scientific™ Multidrop™ Pico Reagent Dispenser
- Thermo Scientific™ Versette™ Automated Liquid Handler

General labware

- Lab bottles: HPDE, LDPE, PP, PPCO, and more
- Beakers
- Cylinders
- Erlenmeyer flasks
- Carboys
- Bench protector
- Tubing
- Environmental bottles
- Centrifugeware
- Snap-cap and screw-cap microtubes

- Drop-dispensing bottles and wash bottles

- Cleaning, safety, and organization labware

Filtration

- Thermo Scientific™ Nalgene™ rapid-flow bottle-top filter units in PES, SFCA, nylon, and CN membranes
- Thermo Scientific™ Nalgene™ analytical filters and filter funnels
- Thermo Scientific™ Nalgene™ syringe filters

Clinical consumables

- Thermo Scientific™ Samco™ sample collection and specimen containers
- Petri dishes, tubes, and accessories
- Thermo Scientific™ Capitol Vial™ polypropylene flip-top vials and containers
- Thermo Scientific™ Samco™ transfer pipettes
- Drugs-of-abuse testing products
- Loops and needles

Sample storage

- Thermo Scientific™ Nalgene™ and Nunc™ cryotubes
- Thermo Scientific™ Matrix™ and Nunc™ 2D barcoded tubes
- Thermo Scientific™ Nunc™ and Abgene™ storage plates
- Automated and manual decapping systems
- Thermo Scientific™ cap mats and closures

- Heat plate sealing equipment
- Barcode readers
- Cryoboxes and storage accessories
- Thermo Scientific™ Mr. Frosty™ Freezing Container

Packaging

- Diagnostic bottles
- IP2 bottles
- Micro packaging vials
- Narrow- and wide-mouth bottles
- Dropper bottles
- Square bottles
- PET and PETG bottles
- Teflon™ bottles
- Custom capabilities

Immunoassay plates

- Covalent and affinity binding
- Colorimetric assays and ELISAs
- Solid-phase and liquid-phase assays
- Custom capabilities

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