

# Cancer

**Integrated Solutions for Basic Research & Translational Discovery** 

## **Unraveling the Complex Landscape of Cancer**

# Introduction \_\_\_\_\_

#### Innovation to Meet the Needs of Evolving Cancer Hallmarks

Cancer is the leading cause of death worldwide, accounting for nearly one in six deaths. In order to navigate the complex landscape of mutations and diverse types of genetic aberration that leads to cancer, the hallmarks of cancer were initially proposed two decades ago. These are a set of functional capabilities acquired by human cells as normal cells transform into tumor cells in a multi-stage process that generally progresses from pre-cancerous lesion to a malignant tumor.

As cancer hallmarks have evolved since their introduction, so has our portfolio of tools to support cancer research. Over this time, we have called upon our diverse scientific and technical expertise to create innovative technologies, assays, and reagents to aid with genomics, protein, cellular and tissue analysis, in addition to small molecules chemistry.

With our comprehensive catalog of unique products, we are committed to providing the tools and support you need to drive innovation and advancement in cancer and help discover the next hallmark.







## Target Analysis

Validation of the target is achieved with target analysis to understand and control its regulatory mechanism, and the role that plays in the hallmarks of cancer.

CYTO-ID<sup>®</sup> **Autophagy Detection** Kit 2.0

# Target Identification

Whether it's a specific gene, protein, lipids, or a whole pathway, target identification is one of the most critical steps in cancer research and drug discovery.

#### **AMPIVIEW™ RNA Probes**

AMPIVIEW<sup>™</sup> RNA probes are uniquely designed with the precision of targeted, sequence-specific RNA, powered by Enzo's LoopRNA<sup>™</sup> ISH technology to deliver superior sensitivity when combined with Enzo's immunochemistry detection solutions. With sample morphology preserved, the spatial localization of target biomarkers can be visualized under the light microscope.

- Detection of unique nucleic acid targets (DNA/RNA or RNA) down to a single cell level
- Simple protocols of 2-hour hybridization and one-step amplification.
- Adaptable products ready for any workflow (Manual or Automated)

## **AMPIVIEW™ RNA Probes Deliver** Superior Sensitivity and Specificity



AMPIVIEW<sup>™</sup> RNA probes workflow diagram. Detection of epidermal growth factor receptor (EGFR) in prostate tissue with A. AMPIVIEW™ EGFR (AS) Dig RNA probes and B. AMPIVIEW™ NSP Dig RNA probes, amplified with DIGX® anti-digoxigenin, detected with POLYVIEW® PLUS AP combined with HIGHDEF® Red AP chromogen and hematoxylin.

Genome instability and mutations are two of the most common causes of cancer. Fluorescence *in situ* hybridization (FISH) techniques provide a way to visualize and map the genetic material in individual cells. This is a very useful tool to understand a variety of chromosomal abnormalities and other genetic mutations.

#### DEEPSEE® CDKN2A/CEN3/7/17 **Quad Probe Assay (ENZ-GEN440)**

Ready-to-use probes, used to detect the most frequently encountered chromosomal abnormalities in bladder cancer, contain fluorescently labeled nucleic acid targeting CDKN2A or p16 (gold) and three chromosomes, 3 (red), 7 (green) and 17 (aqua).

- Validated for use with cells and urine samples
- Ready-to-use probe mix to minimize pipetting errors
- Rapid detection of chromosomal aneuploidies and identification of loss

AMPIVIEW™ RNA Probes	
AMPIVIEW™ EGFR (AS) Dig RNA Probes Set	ENZ-GEN129
AMPIVIEW™ HPV 6/11 RNA Probes Set	ENZ-GEN145
AMPIVIEW™ HPV 16/18 RNA Probes Set	ENZ-GEN146
AMPIVIEW™ HPV 31/33/51 RNA Probes Set	ENZ-GEN147
AMPIVIEW™ HPV High-Risk RNA Probes Set	ENZ-GEN148
AMPIVIEW™ Ubiquitin and NSP Dig Control Probes Kit	ENZ-KIT223
AMPIVIEW™ GAPDH and NSP Dig Control Probes Kit	ENZ-KIT224

#### **Related Products**

CYTAG<sup>®</sup> CGH Labeling Kit **CYTAG®** SuperCGH Labeling Kit CYTAG<sup>®</sup> Total CGH Labeling Kit **CD3** Recombinant Monoclonal Antibody **CD4** Recombinant Monoclonal Antibody CD8 (a chain) Recombinant Monoclonal Antibody **CD19 Recombinant Monoclonal Antibody CD23 (Human) Monoclonal Antibody CD33 Recombinant Monoclonal Antibody** CD44std (Human) Monoclonal Antibody

# **Target Identification**

## **Quadruple Color Assay for the** Detection of CDKN2A/CEN3/7/17



A. Normal cytological specimen hybridized with DEEPSEE<sup>®</sup> CDKN2A/ CEN3/7/17 Quad Probe. Two red (CEN 3), two green (CEN 7), two aqua (CEN 17), and two gold (CDKN2A) signals indicating normal interphase nucleus. B. Right: UM-UC-3 bladder cancer cells hybridized with DEEP-SEE® CDKN2A/CEN3/7/17 Quad Probe showing trisomy 9, indicated by 3 CDKN2A (gold) signals in the nucleus.

ENZ-42671 ENZ-GEN120 ENZ-42674 **ENZ-ABS424** ENZ-ABS430 ENZ-ABS323 ENZ-ABS412 ENZ-ABS248 ENZ-ABS625 ALX-801-089

# **Target Characterization**

Some targets can play different roles depending on the cell type or microenvironment, hence, the characterization step is crucial for the understanding of the functional role that plays in normal cells vs cancer cells.

Cancer cells survive and adapt to many types of stress, including hypoxia, nutrient deprivation, metabolic, and oxidative stress.

#### **ROS-ID® Hypoxia/Oxidative Stress Detection Kit (ENZ-51042)**

ROS-ID<sup>®</sup> Hypoxia/Oxidative Stress Detection Kit is designed for the functional detection of hypoxia and oxidative stress levels in live cells (both suspension and adherent) using fluorescent microscopy or flow cytometry.

- Detection of hypoxia with high sensitivity, selectivity and accuracy in cancer tissues and cells
- Allow for simple single-step detection of hypoxia in non-fixed cells and tissues
- Dyes can be combined with reactive oxygen species (ROS) detection reagents for multiplexing

## **Multiplex Hypoxia and Oxidative Stress Detection**



HeLa cells were seeded on microscope slides and treated, the next day, with DFO (chemical inducer of hypoxia) or pyocyanin (oxidative stress inducer) for 4 h at 37°C as described in the manual. ROS-ID<sup>®</sup> was used to detect hypoxia (red) and oxidative stress (green). Post-treatment, slides were washed with PBS, cover-slipped and visualized using an Olympus BX-51 fluorescence microscope.

Understanding the roles of DNA damage repairs in the promotion of cancer is essential for the development of targeted cancer therapy.

Exposure of cells to oxidative and environmental stresses frequently results in the breakdown of genomic DNA.

#### **DNA Damage ELISA Kit** (ADI-EKS-350)

The DNA Damage ELISA kit is a colorimetric competitive enzyme immnoassay kit that evaluates the integrity of genomic DNA by assessing the presence of oxidized DNA that are frequently used to verify the onset of apoptosis or DNA damage.

Rapid DNA Damage ELISA kit for cancer, apoptosis, and oxidative stress.

- Reliable and validated in a variety of sample matrices
- Fully quantitative results that surpass semi-quantitative Western blot analysis
- No edge effect allowing to assay more samples per kit

## **Related Products**

**ROS-ID® Total ROS/Superoxide Detection Kit GFP-CERTIFIED®** Apoptosis/Necrosis Detection Kit NUCLEAR-ID<sup>®</sup> Green Cell Cycle Kit **PKA Kinase Activity Kit** Akt Kinase Activity Kit **PKC Kinase Activity Kit** 

ENZ-51010 ENZ-51002 ENZ-51014 ADI-EKS-390A ADI-EKS-400A ADI-EKS-420A

#### **Ordering Information**

**ELISA KITS** 

IL-8 (human), ELISA Kit IL-33 (human) ELISA Kit VEGF (human) ELISA Kit **DNA Damage ELISA Kit** cAMP complete ELISA Kit cGMP complete ELISA Kit

## **Target Characterization**

**Highly Sensitive DNA Damage Measurements for Cancer, Apoptosis, and Oxidative Stress** 



Standard Curve of DNA damage. Highly sensitive assay, detecting as low as 1ng/ml with results in less than 2.5 hours.

> ADI-900-156A ADI-900-201 ENZ-KIT156 ADI-EKS-350 ADI-900-163A ADI-900-164

# **Target Analysis**

Validation of the target is achieved with target analysis to understand and control its regulatory mechanism, and the role that plays in the hallmarks of cancer.

Programmed cell death, such as apoptosis and autophagy, are regulated by a variety of biomacromolecules. Emerging evidence has revealed that programmed cell deaths are key features of tumorigenesis.

#### **CYTO-ID®** Autophagy Detection Kit 2.0 (ENZ-KIT175)

Monitor autophagy in live cells with CYTO-ID® Autophagy Detection Kit 2.0, which contains a brighter and more photostable dye that stains autophagic vesicles specifically.

- Rapid, no transfection required, and only 30 minutes of incubation
- Negligible staining of lysosomes reduces background seen with other dyes
- Facilitates high-throughput screening of activators and inhibitors of autophagy

## **Quantify Autophagic** Vacuoles Without Transfection





CYTO-ID<sup>®</sup> Autophagy Detection Kit 2.0 (ENZ-KIT175) was used to detect autophagy in HeLa cells cultured in (A) media under normal conditions, (B) starvation media (EBSS) treated with 40uM Chloroquine for 4 hours. Starved cells show a higher quantity of autophagic vacuoles compared to cells under normal conditions (fluorescent green).

High-quality biomarkers for cancer, especially antibodies, are crucial tools for prevention, diagnosis, prognostics, therapy, and to effectively monitor treatment response after disease modifying treatments.

Enzo's portfolio of antibodies for cancer research includes thousands of monoclonal and polyclonal antibodies validated for various applications, including immunohistochemistry (IHC), immunofluorescence (IF), flow cytometry, and Western blotting.

#### **High-Quality Antibodies for Cancer** Research

Enzo offers an extensive repertoire of high specificity antibodies for the study of cancer hallmarks, including predictive biomarkers such as p53, EGFR or p16.

- Rigorously validated in several applications
- Superb performance documented in thousands of peer-reviewed publications
- Backed by Enzo's Worry-free Antibody Trial Program

Related Products	
ENZ-LIB102	
BML-2836	
BML-2838	
ENZ-CHM102	
ENZ-CHM158	
ENZ-CHM160	
BML-EI396	

#### **Related Products**

POLYVIEW<sup>®</sup> PLUS HRP (anti-rabbit) Reagent POLYVIEW<sup>®</sup> PLUS AP (anti-rabbit) Reagent POLYVIEW<sup>®</sup> PLUS HRP (anti-mouse) Reagent POLYVIEW<sup>®</sup> PLUS AP (anti-mouse) Reagent HIGHDEF® DAB Chromogen/Substrate Set HIGHDEF® Green AP Chromogen/Substrate Set

HIGHDEF<sup>®</sup> Hematoxylin

# **Target Analysis**

#### **Highly Sensitive and Specific** Detection of p53 in FFPE Tissue



p53 detection endometrial carcinoma with p53 monoclonal antibody (PAb122) (ADI-KAM-CC0022).

## Antibodies Related to Cancer

#### CTLA-4 (1E6)

Cytokeratin 1/5/10/14 (346E12) EGFR (528)

HER-2/Neu

Ki67

LAG-3 (L4-PL33)

D16<sup>INK4a</sup>

p504S p63 + HMWCK cocktail p53 (PAb122) PD-1 (4F12) PD-L1

ENZ-C34903 **ENZ-ABS481** ENZ-ABS381 **ENZ-ABS678** ENZ-ABS677 ENZ-ABS377 ENZ-ABS717 ADI-KAM-CC002 ENZ-ABS737 ENZ-ABS693

**ENZ-ABS696** 

ENZ-ACC103 ENZ-ACC110 ENZ-ACC104 ENZ-ACC114 ENZ-ACC105 ENZ-ACC130 ENZ-ACC106

# Enabling Cancer **Research**

Leverage over 45 years of innovation and technical expertise supporting drug development, discovery, research, and diagnostics through our core technology platforms. With over 150,000 citations, GMP and ISO certifications, our highly-sensitive, quality products consistently deliver trusted results. We maintain product integrity and reliability with our in-house U.S. manufacturing facility. We deploy our bench of expert Ph.D scientists to provide technical, tailored, support for our customers and their projects.

Rely on our extensive experience in innovation, technology development, and manufacturing to support your cancer research and development. Our comprehensive Life Sciences Contract Services support the development of customizable, unique, and efficient solutions for all your research needs.



**GENOMIC ANALYSIS** Nucleic Acid Extraction, PCR, qPCR, and NGS



**PROTEIN ANALYSIS** 

ELISA, Western Blot, Proteins, Peptides, and Enzymatic Assays



**CELLULAR ANALYSIS** Cell-based Assays, Fluorescent Dyes, and Antibodies

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**TISSUE ANALYSIS** IHC, ISH, and FISH





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