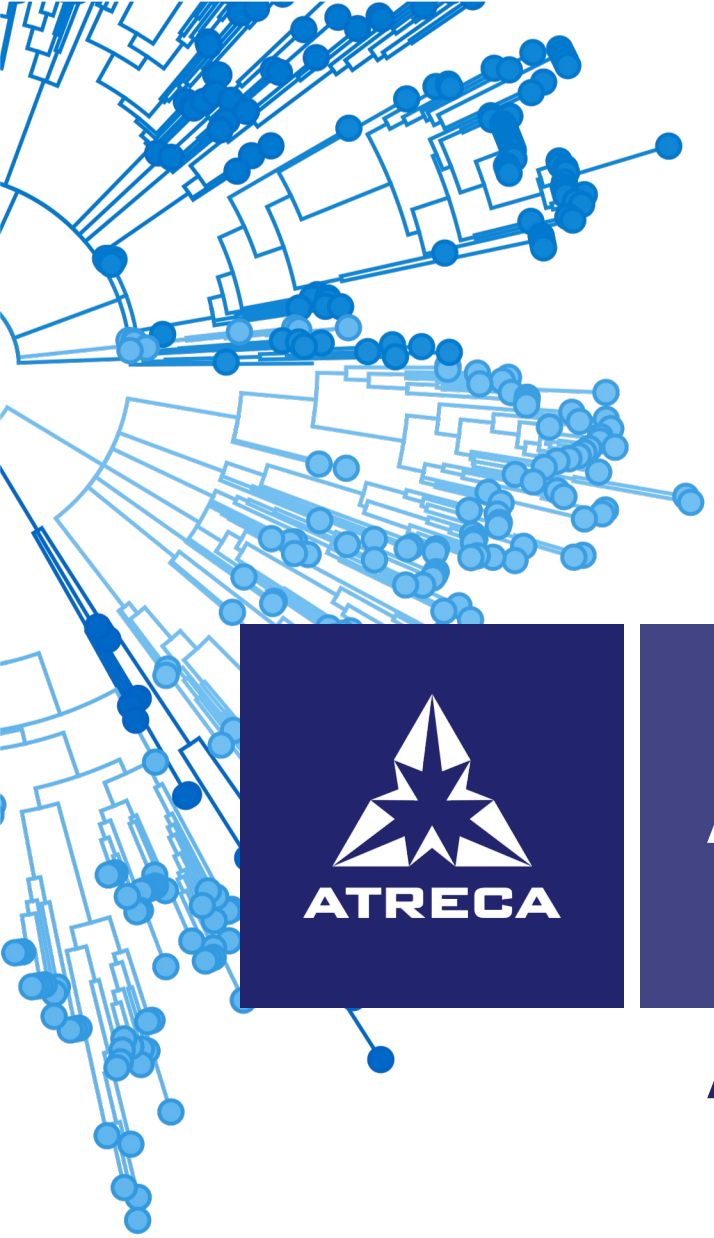


Atreca, Inc. Corporate Overview

August 2023

Legal Disclaimer

This presentation and the accompanying oral commentary contain forward-looking statements about us and our industry that involve substantial risks and uncertainties. All statements other than statements of historical facts contained in this presentation and the accompanying oral commentary, including statements regarding our future results of operations or financial condition, business strategy and plans and objectives of management for future operations, are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. In some cases, you can identify forward-looking statements because they contain words such as "potential," "believe," "target," will," "demonstrate," "expect," "anticipate," "continue," "may," "plan," "predict," "present," "aim," "goal" or the negative of these words or other similar terms or expressions, although not all forward-looking statements contain these words.

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements include, but are not limited to, statements concerning the following: our ability to identify and develop potentially valuable therapeutic antibodies and product candidates through our discovery platform and collaborations with third-parties, including potential treatments for large patient populations across multiple tumor types; the implementation of our business model and our strategy and future plans for our business, technologies, and current or potential future product candidates; the initiation, timing, progress and results of our research and development programs, preclinical studies, and clinical trials; plans to nominate multiple oncology clinical candidates in 2023 and planned IND filings for additional oncology programs in late 2024 and early 2025; our plans to nominate a candidate for APN-497444 and APN-346958 in 2023; our plans to target an IND for APN-497444 in late 2024/early 2025; our plans to target an IND for APN-346958 by early 2025; our plans for collaborating with Xencor, including our plans for up to two joint programs with Xencor; our ongoing evaluation, optimization, and expansion of our pipeline of oncology programs and infectious disease programs, and the productivity of such programs, including APN-497444, APN-346958, ATRC-501/MAM01 and our other programs advancing in various formats; our ongoing evaluation of ATRC-101; statements regarding Gates MRI's expected Phase 2 study for ATRC-501/MAM01 beginning in 2024; our ability to commence commercialization of any other product candidate; the potential market for malaria prophylactic therapeutics and any other of our therapeutic antibodies and product candidates; our ability to deliver more leads against novel targets more efficiently; greater productivity due to continuing investments; our ability to enable partnership and an internal pipeline due to the scalable nature of our platform; our ability to fund current operations, including our ability to fund our operations into the first quarter of 2024, and develop and commercialize our current or potential future product candidates; our ability to obtain intellectual property rights for our current and potential future product candidates; and our expectations regarding the achievement and timing of our anticipated milestones, including our research, development, clinical, regulatory and other corporate milestones. You should not rely on forward-looking statements as predictions of future events.

We have based the forward-looking statements contained in this presentation and the accompanying oral commentary primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition and operating results. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in greater detail in our filings with the Securities and Exchange Commission (SEC) and available on the SEC's website at www.sec.gov, including in the "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of our most recently filed Annual Report on Form 10-K and Quarterly Report on Form 10-Q, and may cause our actual results, performance or achievement to differ materially and adversely from those anticipated or implied by our forward-looking statements.

The forward-looking statements made in this presentation and the accompanying oral commentary relate only to events as of the date on which the statements are made, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain, and investors are cautioned not to unduly rely on these statements. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time, and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this presentation and the accompanying oral commentary. The plans, expectations, results, events and circumstances reflected in the forward-looking statements may not be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements. We undertake no obligation to update any forward-looking statements made in this presentation and the accompanying oral commentary to reflect events or circumstances after the date of this presentation and the accompanying oral commentary or to reflect new information or the occurrence of unanticipated events, except as required by law. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments. We qualify all our forward-looking statements by these cautionary statements.

This presentation discusses our current and potential future product candidates that are under clinical investigation and which have not yet been approved for marketing by the U.S. Food and Drug Administration. No representation is made as to the safety or effectiveness of these current or potential future product candidates for the use for which such product candidates are being studied.

Investment Highlights

Proprietary Platform

- Accesses novel targets via interrogation of active human immune responses
- Delivers ADCs that bind targets unlikely to be discoverable by traditional approaches
- Unlocks the tumor glycan class of targets for exploitation by ADCs
- Generates antibodies binding other novel oncology targets for sustained partnering efforts

Robust Pipeline

APN-497444 - Targets a novel and tumor-specific glycan present in >90% of CRC tumors

APN-346958 - CD3-binding T cell engager against a novel target (partnered with Xencor)

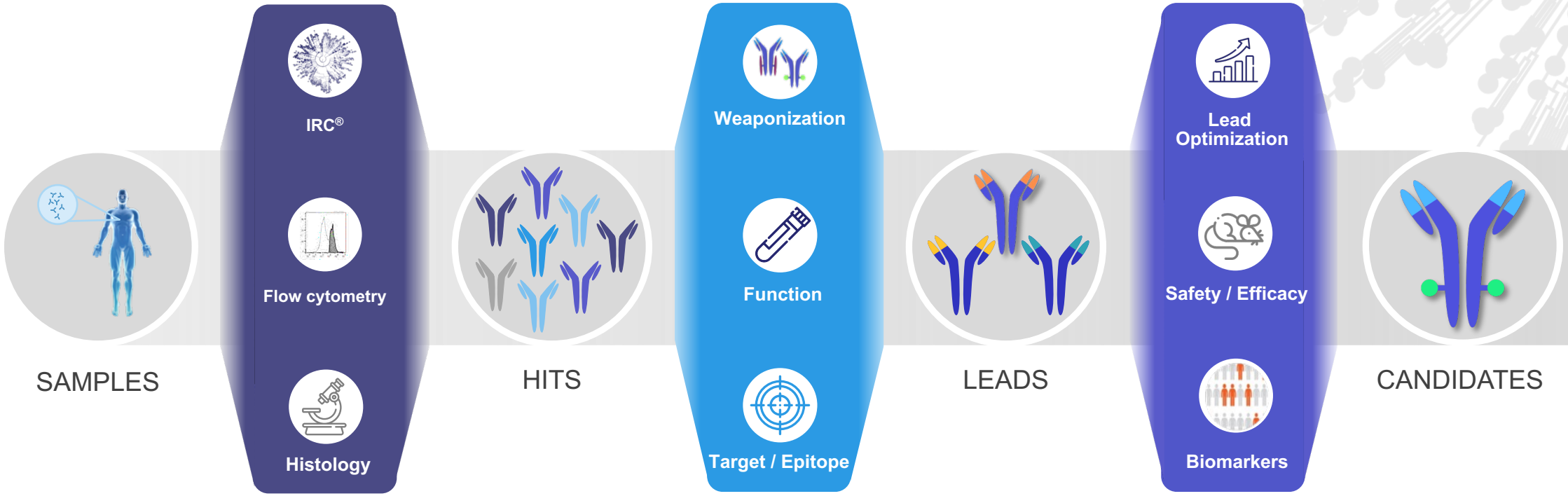
ATRC-501 - Anti-malaria Ab for prophylaxis (licensed to Gates MRI in select geographies)

Upcoming Milestones

- Multiple oncology clinical candidates expected to be nominated in 2023
- IND filings for additional oncology programs targeted in late 2024 and early 2025

Atreca's Platform Built and Optimized over a Decade

From patient immune responses to clinical candidates

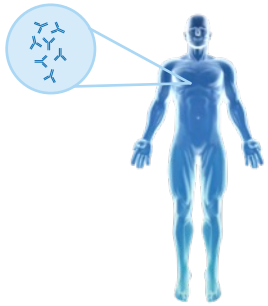


Scalable platform delivers ADC candidates with potent anti-tumor activity binding novel targets with low normal tissue expression

IRC, Immune Repertoire Capture

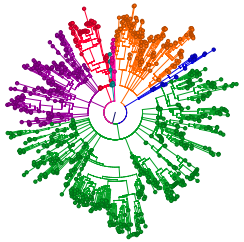
Atreca Inverts the Discovery Paradigm to Generate Hits

The **HUMAN IMMUNE SYSTEM** tells us what is important



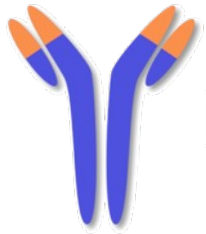
Patient with anti-tumor immune response

Immune Repertoire Capture®



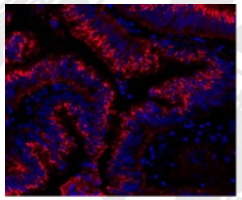
The **active** B cell response at the **single-cell** level

Selection *in silico*



Synthesized **novel antibodies**

Screening *in vitro*



Hit Antibodies

The Atreca Platform uses a **novel approach** to discover antibody-based cancer therapeutics:

We **generate sequences of antibodies** expressed by single B cells in the **active anti-tumor response** of a patient

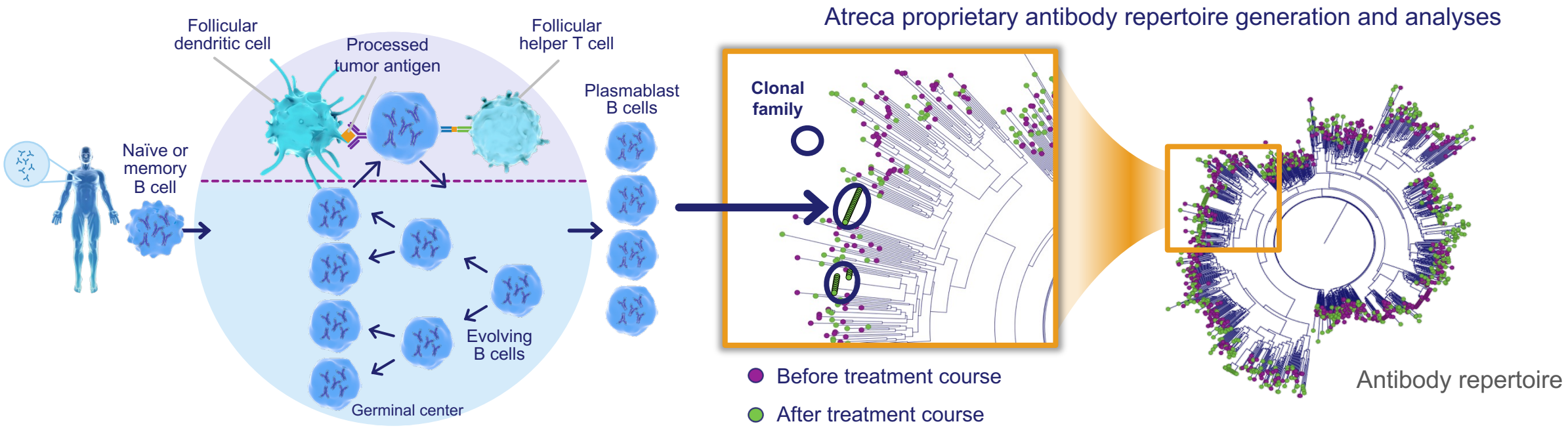
We **analyze these sequences *in silico*** to select potentially valuable antibodies for wet lab analysis

We **screen these antibodies *in vitro*** to identify "Hit Antibodies" that bind to both:

- **"Non-autologous" targets** present in tumor tissue across multiple patients; and
- **Cell surface targets** present in a cancer cell line

Atreca's Proprietary Platform Leverages B Cell Biology

B cell responses driven by antigens in infectious disease, autoimmunity, and cancer*

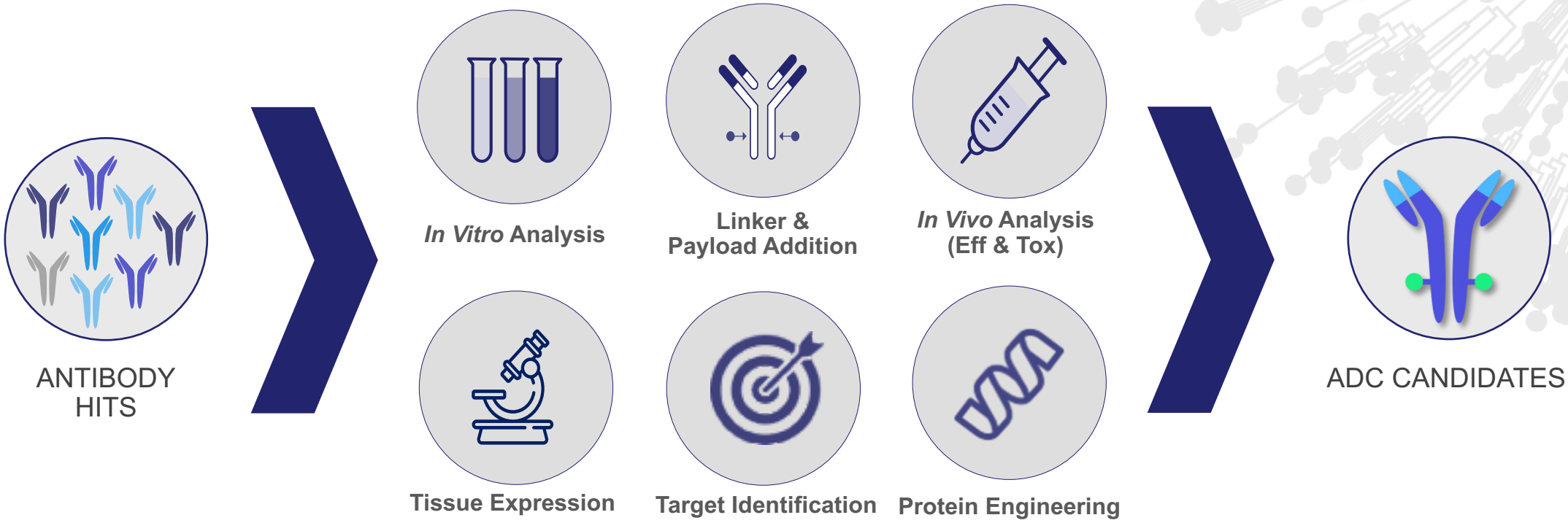


- Plasmablasts express antibodies targeting antigens being processed by an active immune response
- Clonal families of plasmablast antibodies are generated in germinal centers during an adaptive immune response

*Foundational patents granted in multiple jurisdictions that feature **composition of matter** claims directed to libraries of native pairs of antibody heavy and light chain sequences generated from plasmablasts using nucleotide barcoding at the single-cell level*

*DeFalco J, et al. *Clin Immunol*. 2018;187:37–45.

Atreca's Platform Generates High Quality ADC Candidates



>3% of our antibodies that bind to at least one cancer cell line are active as ADCs

Because histology is key to our process, we focus on tumor-specificity early in discovery

We pair antibodies with an appropriate linker-payload via a flexible in-licensing approach

Pipeline

Atreca's Pipeline

Candidate / Lead	Target	Format	Potential Indications	Lead	Candidate / Preclinical	Phase 1	Phase 2	Collaborator
ONCOLOGY: ADC								
APN-497444	**Glycan (tumor-specific)**		Gastrointestinal Cancers	→				ATRECA
APN-987481	**Glycan (tumor-specific)**		Gastric, Pancreatic, Esophageal	→				ATRECA
APN-685612	**In Process**		Gynecologic	→				ATRECA
ONCOLOGY: NON-ADC								
ATRC-101	**RNP Complex**		Lung, HNSCC, Melanoma, Ovarian	→				ATRECA
APN-346958	**RNA-Binding Protein**		Multiple Solid Tumors	→				ATRECA | xencor
INFECTIOUS DISEASE								
ATRC-501 / MAM01 (Malaria)	***P. falciparum* Circumsporozoite Protein**		Malaria Prophylaxis for Travelers	→				BILL & MELINDA GATES MEDICAL RESEARCH INSTITUTE | ATRECA

ADC, antibody–drug conjugate; EphA2, erythropoietin-producing hepatocellular receptor A2; IgG, immunoglobulin G; MOA, mechanism of action; RNA, ribonucleic acid; RNP, ribonucleoprotein.

ADC Program: APN-497444

APN-497444: A Tumor-Specific Anti-Glycan Antibody

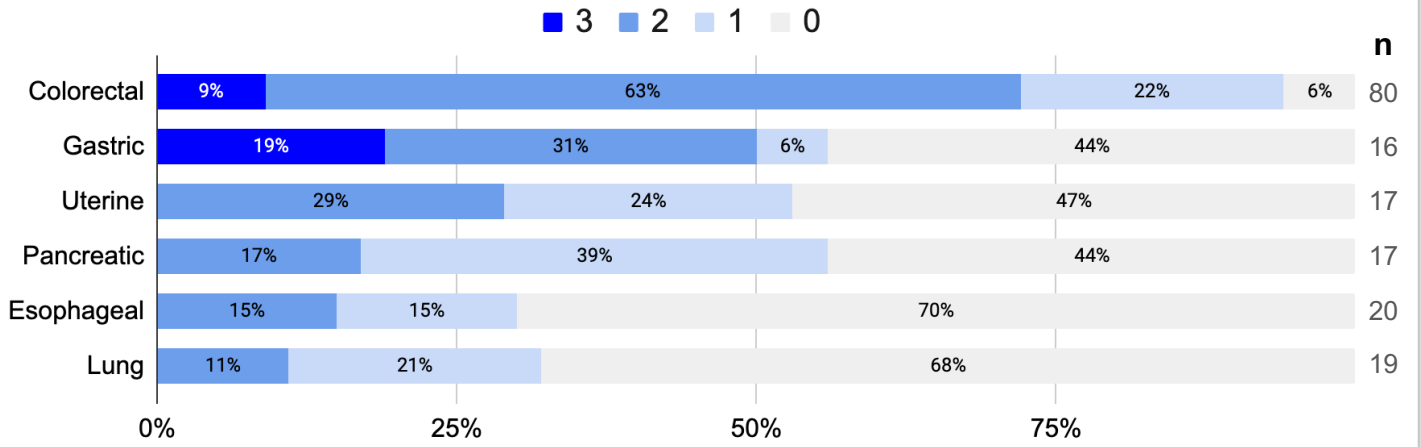
- Recognizes a novel cell surface tumor glycan target that is internalized
- Glycans are a validated but largely untapped target class in oncology
- Potent and selective anti-glycan antibodies are challenging to generate via standard methods

- Displays uniform tumor-selective binding with high prevalence in colorectal cancer
- Exhibits compelling pre-clinical antitumor activity when weaponized as an ADC
- Antibody lead optimization advancing while evaluating a variety of linker-payloads

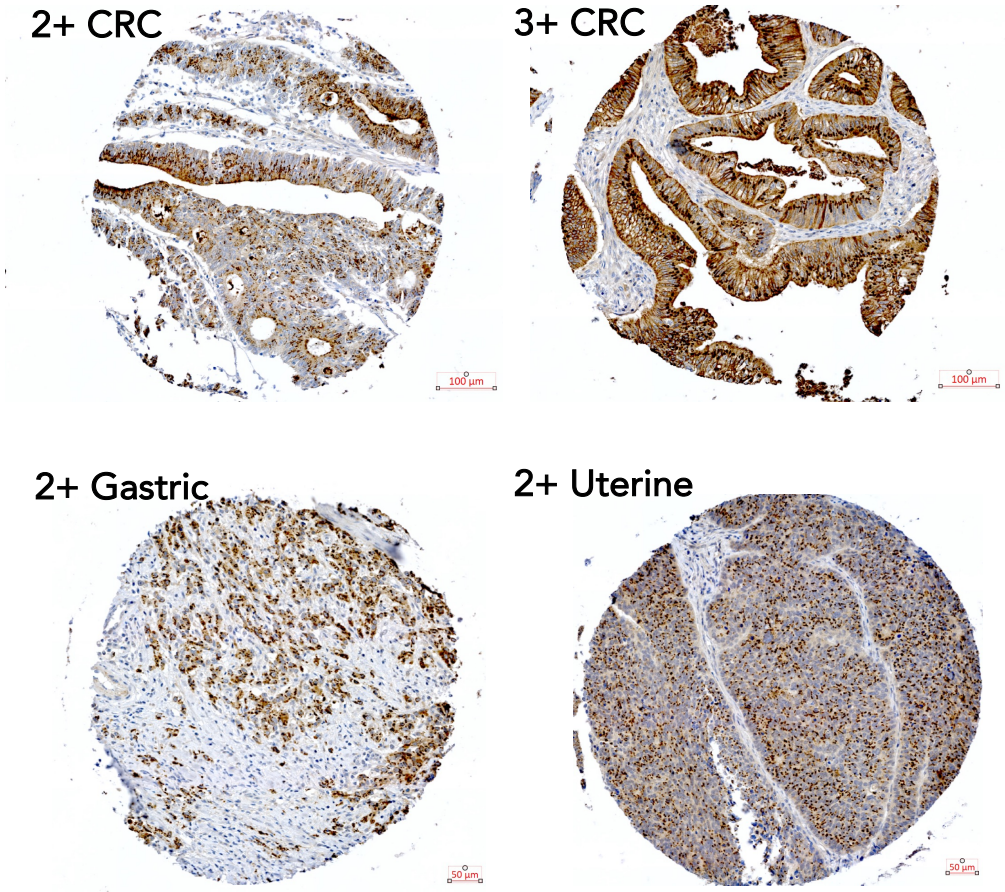
- Candidate nomination expected in 2023
- Targeting IND in late 2024/early 2025.

Homogeneous and Strong APN-497444 Reactivity in >70% of Colorectal Cancer

APN-497444 target expressed in >90% of CRC



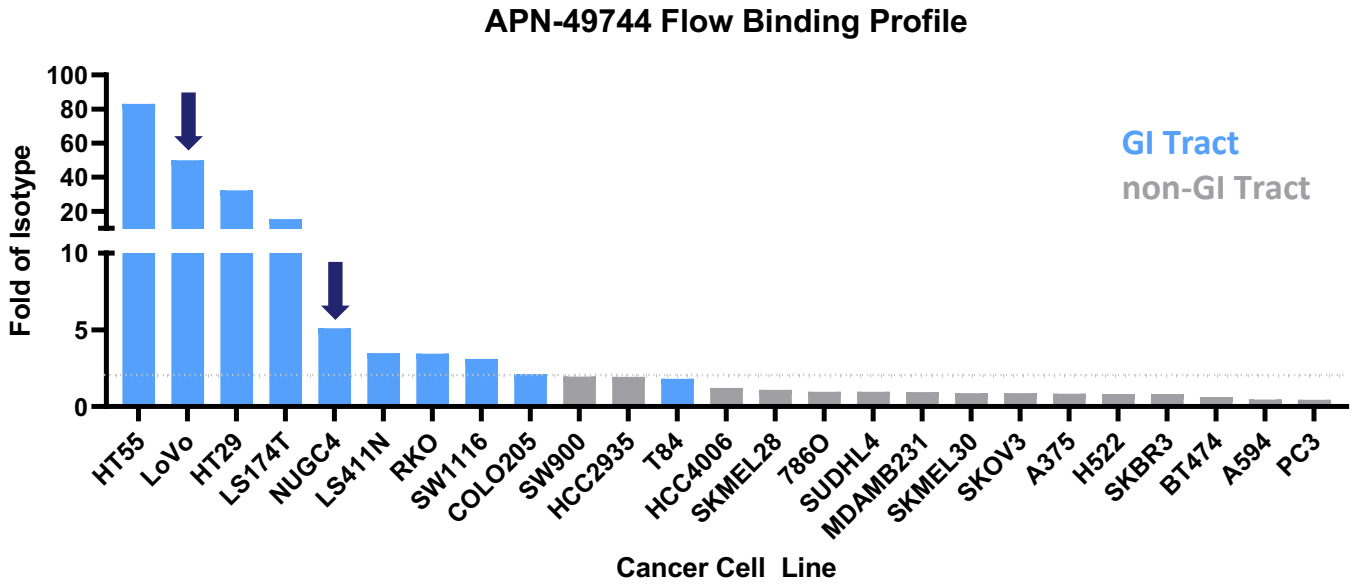
Strong and uniform immunoreactivity



- **APN-497444** target is prevalent in multiple indications such as colorectal, gastric, uterine, and pancreatic cancer
- Expression is uniform in tumors and observed in metastatic lesions within CRC regardless of the metastatic site
- No membranous expression in all 27 normal tissues examined

APN-497444 Shows Selective Binding to and ADC Activity Against Colorectal and Gastric Cancer Cell Lines

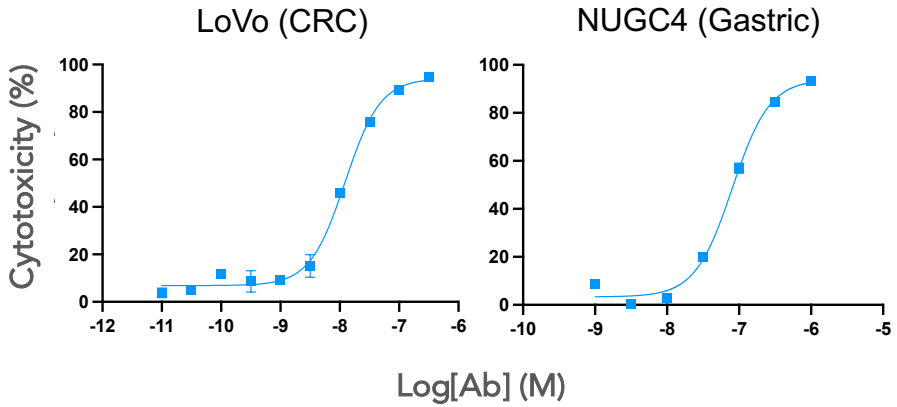
APN-497444 specifically binds to cancer cell lines of GI origin



APN-497444 shows 2-fold signal over isotype control (dotted line) on colorectal and gastric cancer cell lines

ADC activity of APN-497444(ZLA)

***In vitro* cytotoxicity assay**

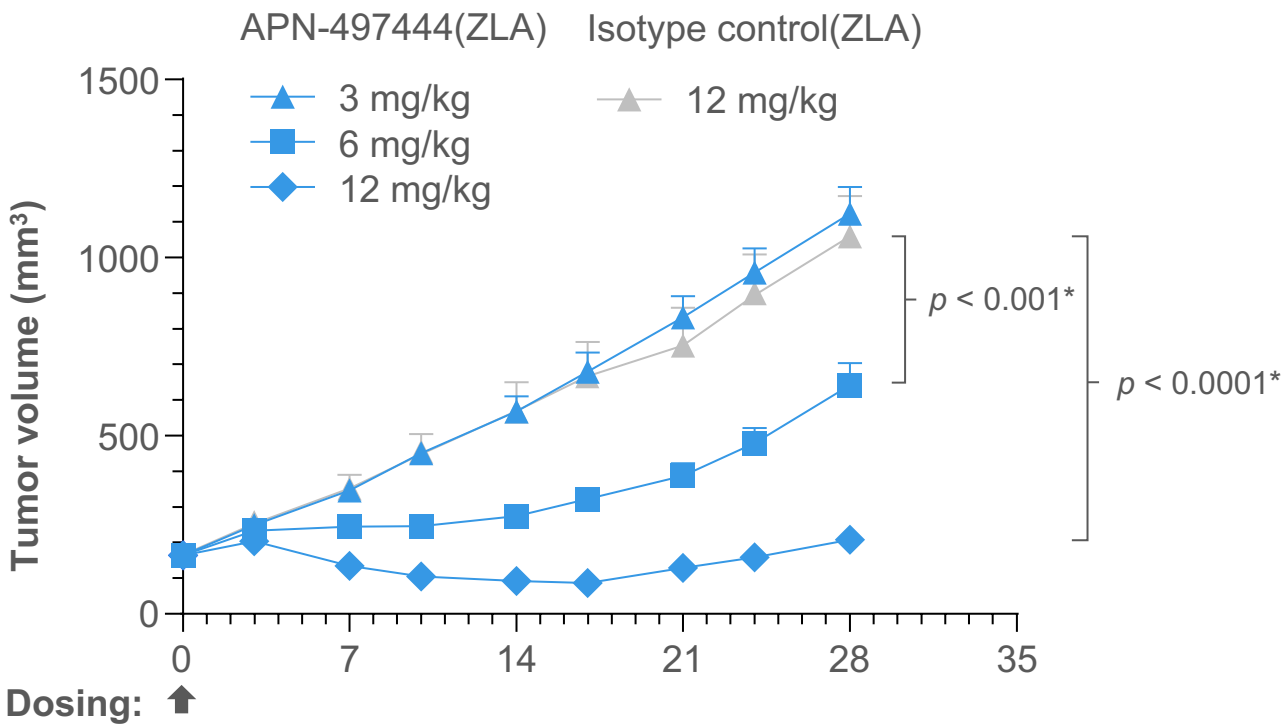


APN-497444(ZLA) shows potent *in vitro* ADC activity in cell lines with a range of target expression

Gastrointestinal (GI).

APN-497444 Shows Potent ADC Activity *in Vivo* in a Relevant Model of Colorectal Cancer

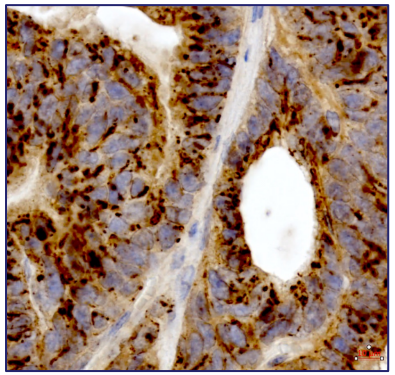
APN-497444(ZLA) shows potent anti-tumor activity in the LoVo tumor model



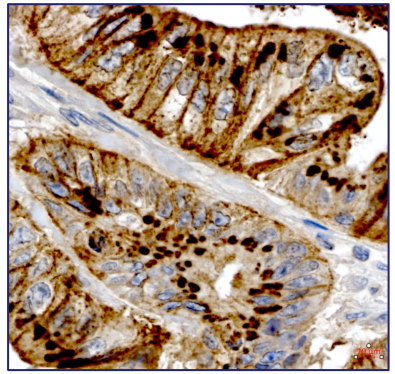
Potent and dose-dependent tumor reduction observed after single-dose

Comparable immunoreactivity of APN-497444 on LoVo xenograft tumors and human CRC

LoVo Xenograft



Human CRC (3+)



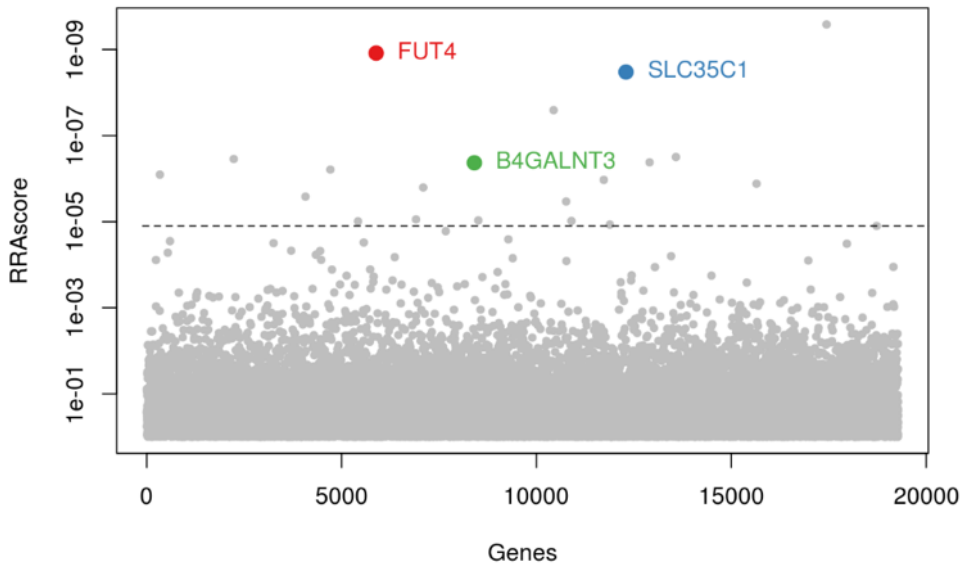
Preliminary safety assessment suggests favorable therapeutic index

- Well tolerated in single and multiple-dose studies in mice without significant body weight loss or histopathologic findings
- Single dose tolerability/PK study in rats revealed dose-proportional PK and no significant findings at 30 mg/kg

*One-sided Wilcoxon rank sum test for the normalized area above the curve at Day 28, ZymeLink ™ Auristatin linker payload (ZLA)

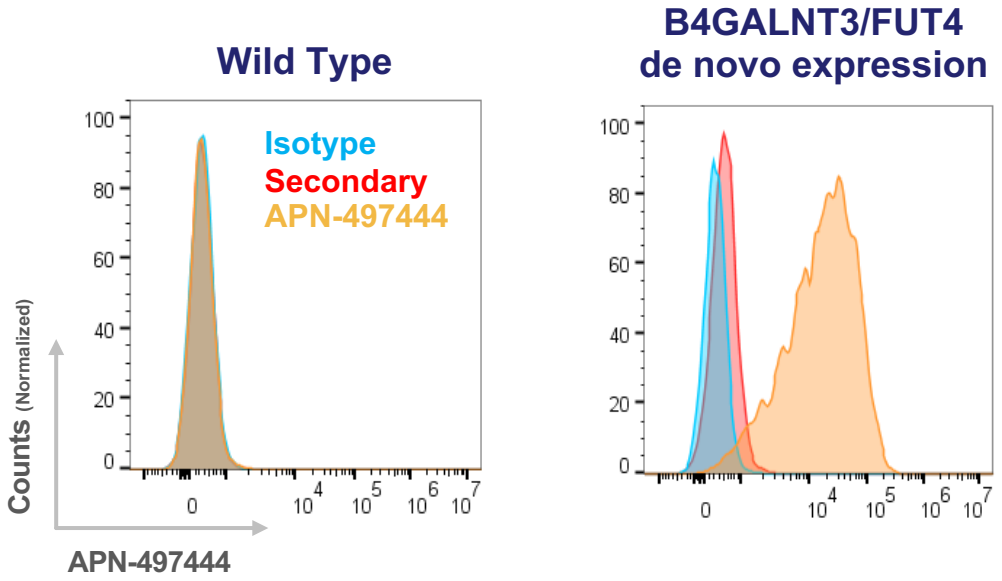
Functional Genomics Identified Genes Responsible for Generating the Glycan Target

Hits from CRISPR screen include multiple glycosylation genes



- Confirmed hits include glycosyltransferases B4GALNT3 and FUT4 as well as fucose transporter SLC35C1
- Enzymes are largely not co-expressed in normal tissues

Dual de novo expression induces binding



- Cell surface expression of **glycan target** can be induced by B4GALNT3 and FUT4 overexpression in target-negative cells
- Cell lines with induced target expression are susceptible to **APN-497444 ADC** mediated cytotoxicity (not shown)

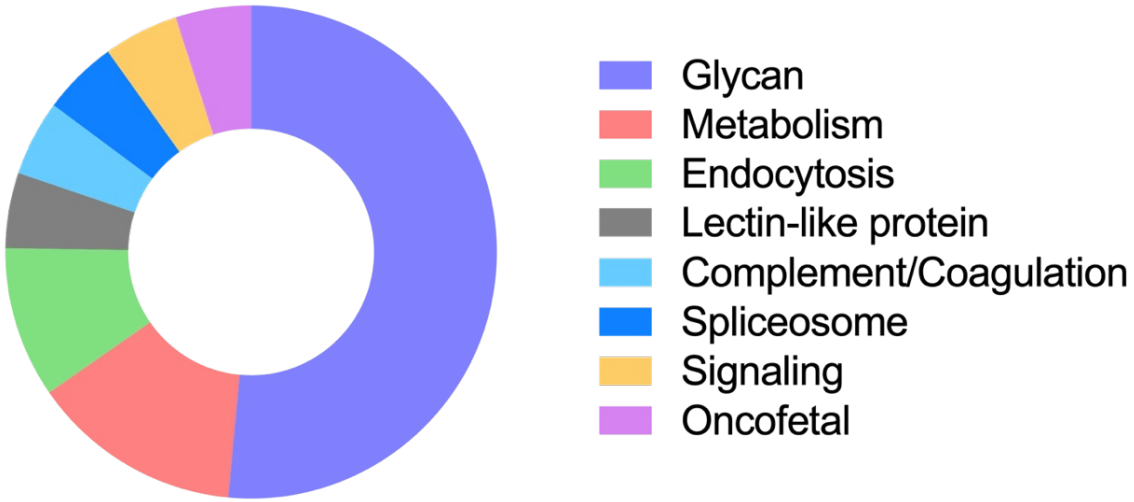
Fucosyltransferase 4 (FUT4), Beta-1,4-N-Acetyl-Galactosaminyltransferase 3 (B4GALNT3), Solute Carrier Family 35 (GDP-Fucose Transporter), Member C1 (SLC35C1), Isotype control (Isotype), secondary Antibody negative control (Sec AB), Antibody-drug conjugate (ADC)

Atreca's Platform Delivers Tumor-specific Anti-Glycan ADC Antibodies Among Other Target Classes

A validated but untapped class of ADC targets

Cancer associated targets identified through the platform

Proportion of targets by class



Multiple glycan-targeting drugs are approved, but utility is limited due to normal tissue expression of their targets

- Aberrant glycosylation is a well-known hallmark of tumors
- However, it is *very challenging* to
  - Identify novel tumor-specific glycans; and
  - Generate high-affinity and selective anti-glycan IgG antibodies through standard methods

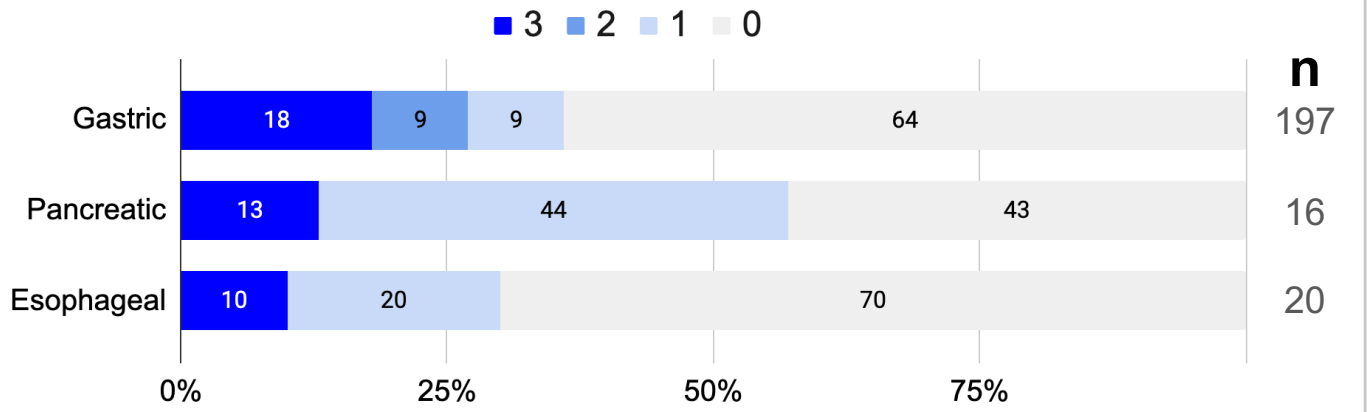
Approximately half of the antibodies whose targets we identify bind to glycan targets

Mislocalized targets are also an emerging target class for our antibodies

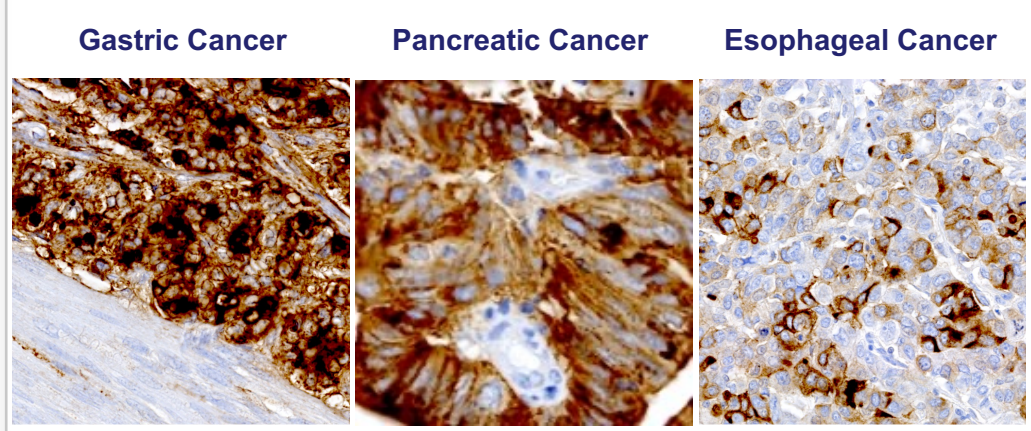
Additional ADC Programs

APN-987481 Shows Strong Reactivity in Gastric and Pancreatic Cancer

APN-987481 pilot prevalence



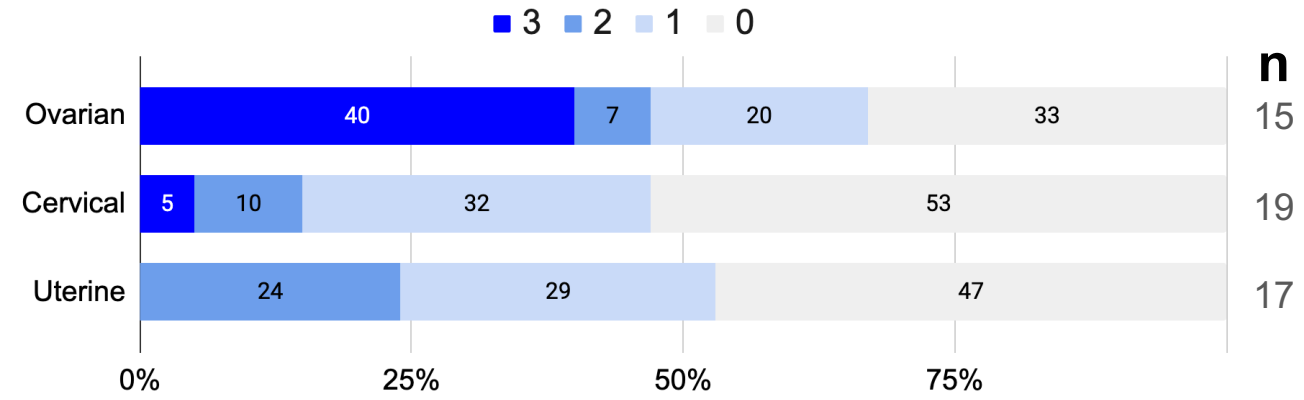
High staining intensity in different indications



- **APN-987481** recognizes a cell surface glycan target prevalent in multiple indications including pancreatic, gastric, and esophageal cancer
- Homogenous expression observed in gastric cancer
- Limited normal tissue reactivity is observed in lymphocyte subpopulation and colon
- De-risking of normal tissue expression ongoing

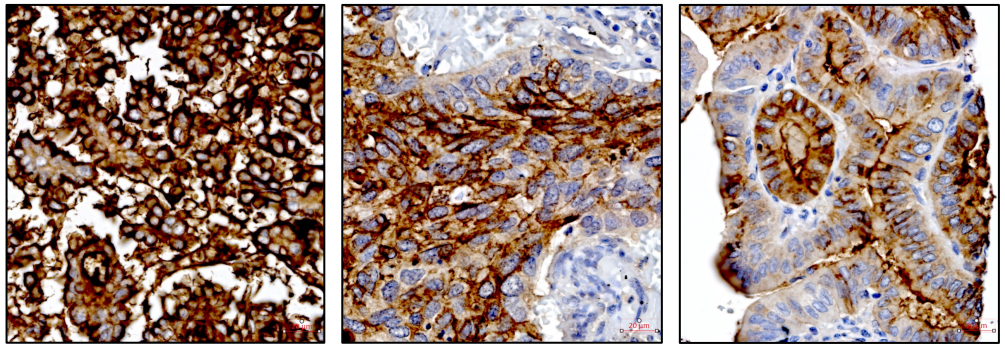
APN-685612 Shows Strong Reactivity in Gynecological Cancers

APN-685612 pilot prevalence



Strong signal with membrane association

Ovarian Cancer | Cervical Cancer | Thyroid Cancer

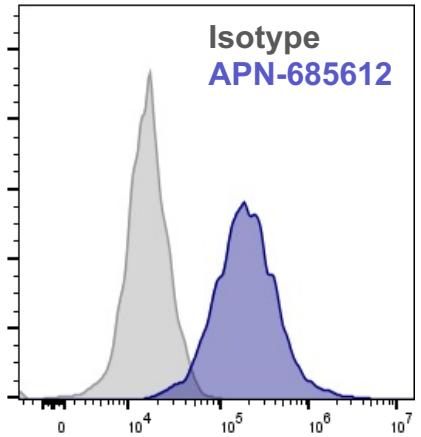


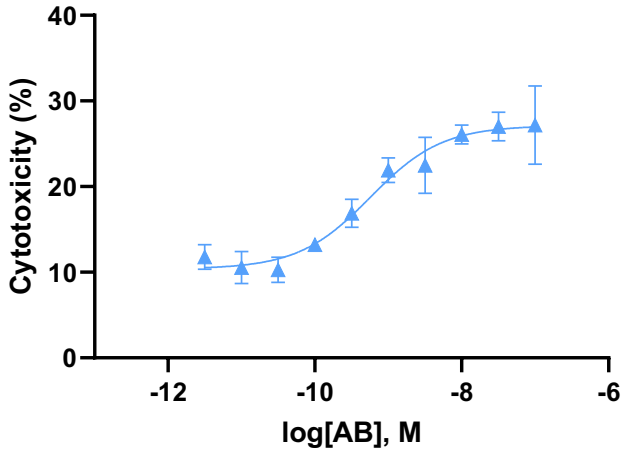
- **APN-685612** target prevalent in ovarian, cervical, uterine and thyroid cancer
- Uniform, clear membranous signal in cancer
- Of 27 organs tested, immunoreactivity was observed in normal ovary, brain, kidney, and pharynx
- Normal tissue expression is mimicked in preclinical tox species enabling early de-risking

Functional ADC Activity of Early Leads on Target Positive Cell Lines

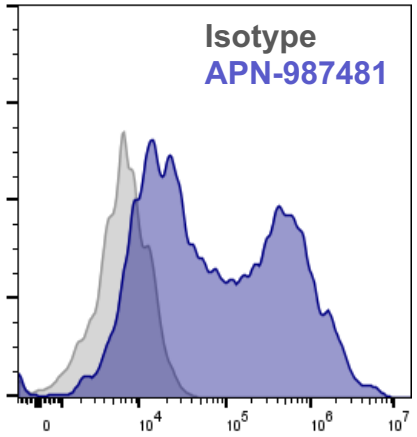
Cytotoxicity assay using Duocarmycin-conjugated secondary antibody

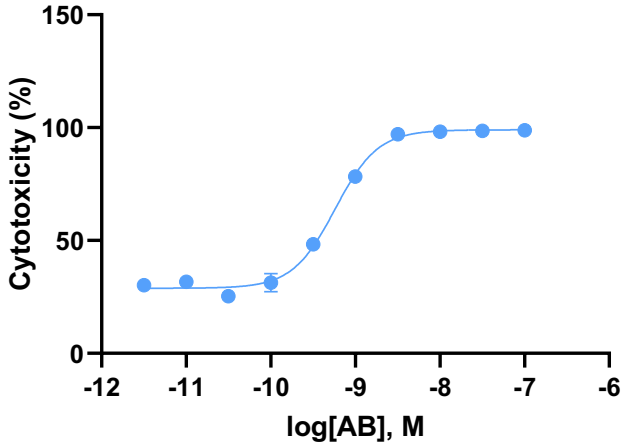
APN-685612: 786O





APN987481: LoVo





- **APN-685612, APN-987481** bind to a surface-expressed target present on multiple human cancer cell lines
- Currently engineering as authentic ADCs and progressing with target identification

T Cell Engager Program: APN-346958

APN-346958: A Tumor-Selective Antibody Recognizing an RNA-Binding Protein Target

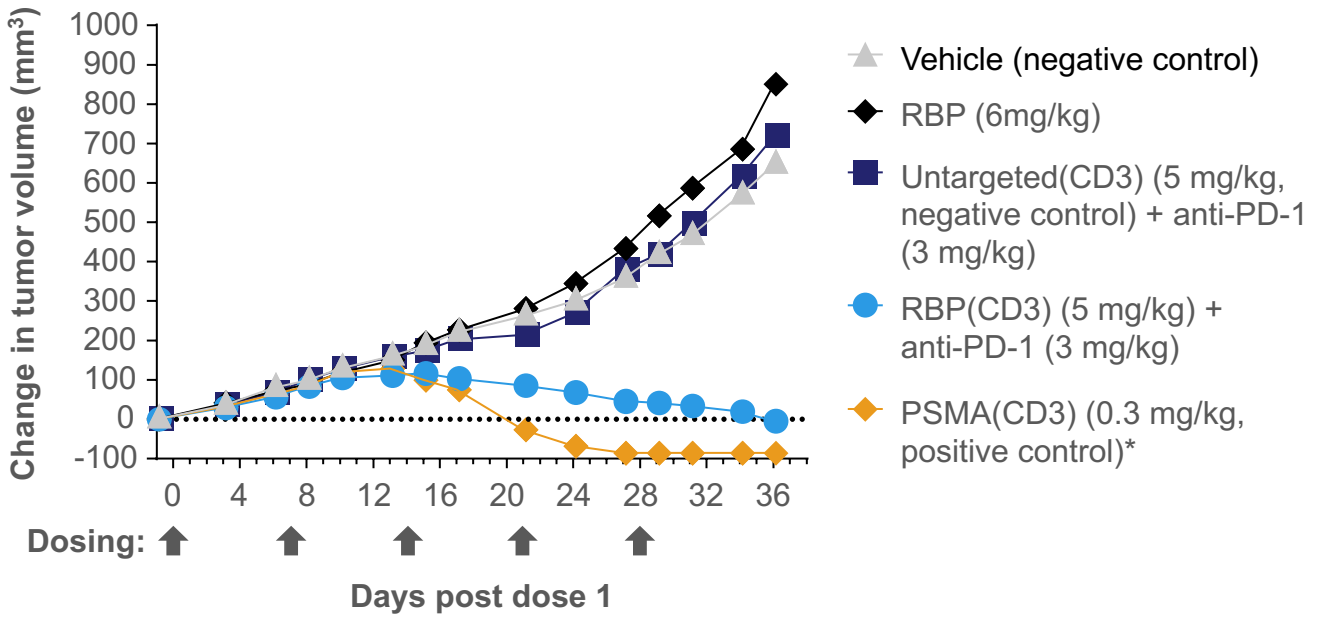
- Novel target of APN-346958 is an RNA-binding protein (RBP)
- Previously unreported mislocalization to the cell surface uncovered by our platform

- Exhibits compelling pre-clinical antitumor activity when weaponized as a T cell bispecific
- Anti-tumor activity accompanied by robust immune activation and T cell expansion

- Joint program in partnership with Xencor with Atreca to lead development
- Candidate nomination expected in 2023
- IND targeted by early 2025

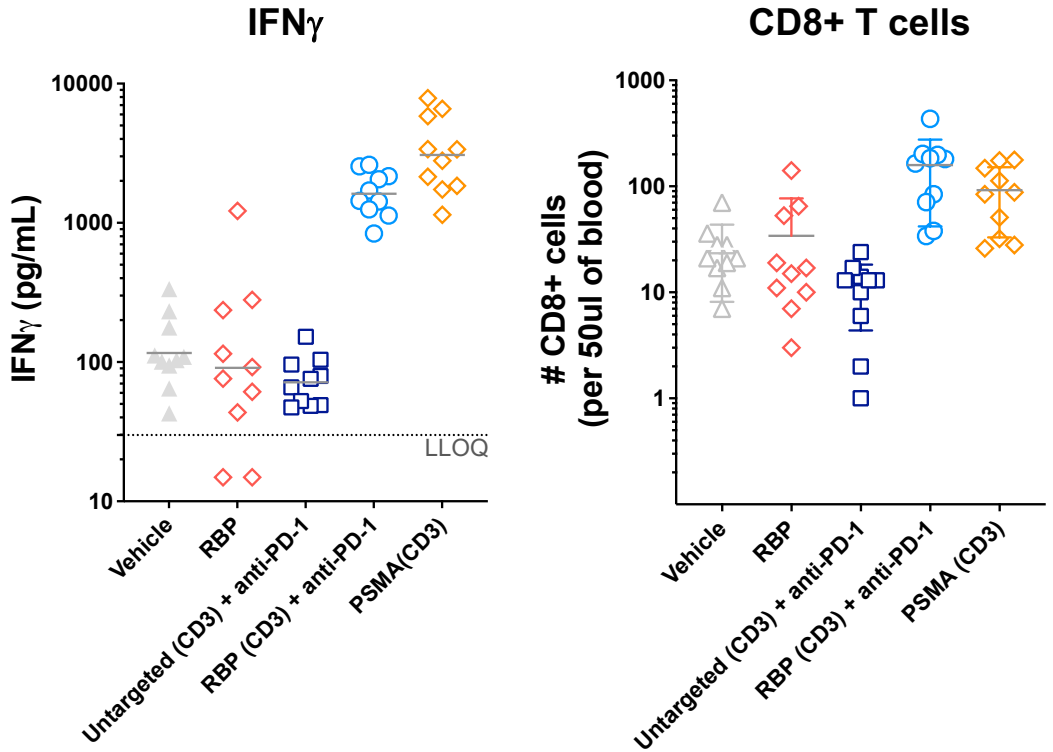
APN-346958(CD3): Anti-tumor and Pharmacodynamic Activity in a Humanized Xenograft Model

APN-346958(CD3) dosing to tumor stasis in a PC3/PSMA tumor model



- The original patient-derived antibody APN-346958 leads to anti-tumor activity when formatted as a CD3 T cell bispecific
- Lead optimization to increase APN-346958(CD3) potency is ongoing

APN-346958(CD3) dosing leads to robust immune activation and CD8+ T cell expansion at D14



PD-1, programmed death-1; PSMA, prostate-specific membrane antigen; RBP, RNA-binding protein, interferon gamma (IFNγ), cluster of differentiation 8 (CD8), lower limit of quantitation (LLOQ)

Collaborating with Xencor to Discover and Develop Novel T Cell-Engaging Bispecific Antibodies

- **Atreca** will provide antibodies against novel targets from which **Xencor** will engineer XmAb bispecific antibodies that bind to the CD3 receptor on T cells
- Up to two joint programs will be mutually selected for further development and commercialization with 50/50 cost and profit sharing
  - APN-346958 selected for joint development
- Each partner may pursue up to two programs independently with royalties payable on net sales
- **Xencor** is a leader in generating **CD3-binding bispecific T cell engagers** from initial antibody engineering and manufacturing through clinical development; advantages of the platform relevant to **Atreca** include:
  - Bispecific Fc domain technology that retains full-length antibody properties in a bispecific antibody format
  - Ability to tune the potency of T cell killing in a plug-and-play manner

ATRC-501 / MAM01

ATRC-501/MAM01: Novel Prophylactic Antibody Against Malaria Licensed to the Gates Medical Research Institute

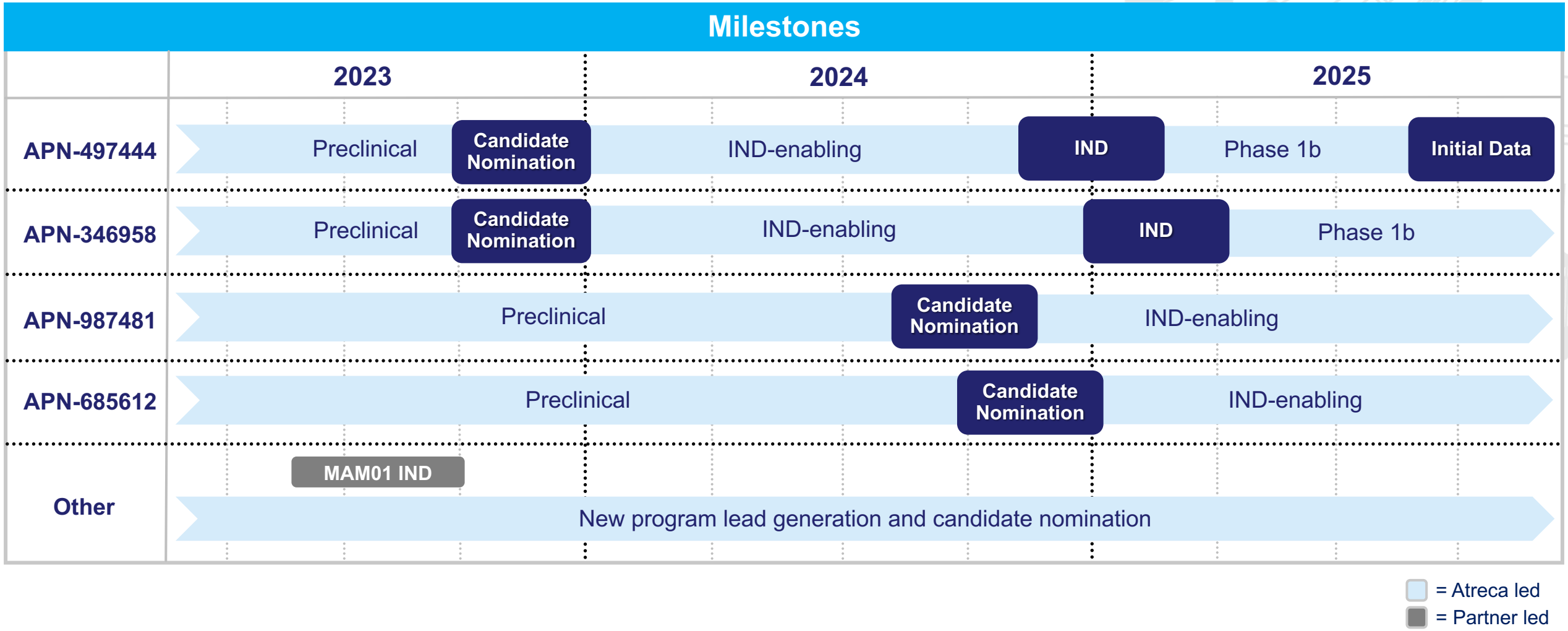
- Discovered by Atreca from a human immune response following inoculation with an approved malaria vaccine (Mosquirix™)
- Antibody binds to the form of the parasite transmitted via mosquito bite
- Demonstrates potent protection against malaria infection in multiple *in vivo* mouse studies

- Licensed to Gates Medical Research Institute for the prevention of malaria
- Gates MRI to lead clinical development and receive commercial rights in GAVI-eligible countries
  - IND cleared by FDA in mid-2023, Phase 2 study expected to begin in 2024
  - License provides Atreca full access to clinical data generated
- Atreca retains commercial rights in the U.S., Europe and parts of Asia
  - Potential product development opportunities include prophylaxis for those travelling to malaria-endemic regions
  - $350M+ market for malaria prophylactic therapeutics in U.S., EU and Asia in 2019

GAVI, Global Alliance for Vaccines and Immunization.

Key Milestones and Financial Overview

Anticipated Milestones



Financials and Intellectual Property

Financial Overview

- Cash, cash equivalents & investments of **$38.5M** as of **March 31, 2023**
- Cash runway expected to fund operations **into 1Q24**
- Total common shares outstanding**: 39.1M** as of **December 31, 2022**

Intellectual Property

- Patents issued in multiple jurisdictions, including the U.S. and Europe, covering critical aspects of Atreca's Immune Repertoire Capture® (IRC®) technology and platform exclusively licensed to Atreca
- Notice of Allowance received for U.S. patent application covering ATRC-501/MAM01
- Patent applications covering other pipeline assets pending

Investment Highlights

Proprietary Platform

- Accesses novel targets via interrogation of active human immune responses
- Delivers ADCs that bind targets unlikely to be discoverable by traditional approaches
- Unlocks the tumor glycan class of targets for exploitation by ADCs
- Generates antibodies binding other novel oncology targets for sustained partnering efforts

Robust Pipeline

APN-497444 - Targets a novel and tumor-specific glycan present in >90% of CRC tumors

APN-346958 - CD3-binding T cell engager against a novel target (partnered with Xencor)

ATRC-501 - Anti-malaria Ab for prophylaxis (licensed to Gates MRI in select geographies)

Upcoming Milestones

- Multiple oncology clinical candidates expected to be nominated in 2023
- IND filings for additional oncology programs targeted in late 2024 and early 2025