RELAY®
THERAPEUTICS

Company Presentation

April 2021

Disclaimer

This presentation contains forward-looking statements and information about our current and future prospects and our operations and financial results, which are based on currently available information. All statements other than statements of historical facts contained in this presentation, including statements regarding our strategy, future financial condition, future operations, projected costs, prospects, plans, objectives of management and expected market growth, are forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as ''aim,'' ''anticipate,'' ''assume,'' ''believe,'' ''contemplate,'' ''continue,'' ''could,'' ''design,'' ''due,'' ''estimate,'' ''expect,'' ''goal,'' ''intend,'' ''may,'' ''objective,'' ''opportunity,'' ''plan,'' ''predict,'' ''positioned,'' ''potential,'' ''seek,'' ''should,'' ''target,'' ''will,'' ''would'' and other similar expressions that are predictions of or indicate future events and future trends, or the negative of these terms or other comparable terminology. These forward-looking statements include express or implied statements about the initiation, timing, progress and results of our current and future clinical trials and current and future preclinical studies of our product candidates; the therapeutic potential and clinical benefits of our product candidates; the combination potential of our product candidates, including RLY-1971 in combination with Genentech's KRAS G12C inhibitor, GDC-6036; the expected strategic benefits and the receipt of potential near-term payments and milestone and royalty payments under our collaboration with Genentech; our ability to successfully establish or maintain collaborations or strategic relationships for our product candidates; the market opportunities for our product candidates; expectations regarding current and future interactions with the U.S. Food and Drug Administration (FDA); our ability to manufacture our product candidates in conformity with the FDA's requirements; the capabilities and development of our Dynamo™ platform, including the potential synergies with ZebiAI's platform; the expected strategic benefits of acquiring ZebiAI; the achievement of certain platform and program-related milestones or entry into partnering or collaboration agreements related to ZebiAI's platform; our financial performance; the effect of the COVID-19 pandemic, including mitigation efforts and economic effects, on any of the foregoing or other aspects of our business operations, including but not limited to our preclinical studies and future clinical trials; our plans to develop, manufacture and commercialize our current product candidates and any future product candidates; and the implementation of our business model and strategic plans for our business, current product candidates and any future product candidates.

Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make due to a number of risks and uncertainties. These and other risks, uncertainties and important factors are described in the section entitled "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2020, as well as any subsequent filings with the Securities and Exchange Commission. Any forward-looking statements represent our views only as of the date of this presentation and we undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, the occurrence of certain events or otherwise. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. No representations or warranties (expressed or implied) are made about the accuracy of any such forward-looking statements.

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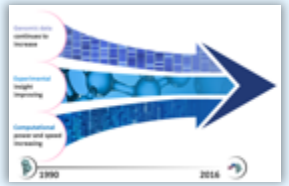
2021 Is a Year of Delivering on Catalysts

2016

Set Vision



- Build a new breed of biotech at the intersection of computation and experimentation
- Push the boundaries of what is possible
- Address inadequately / undruggable precision medicine targets
- Establish Relay Tx as the destination of choice for leading emerging technologies

2017-20

Validated Approach

- Built out the experienced team of 170 FTEs and an integrated platform
- Created and advanced 2 programs into clinical trials with a robust pre-clinical pipeline
- Entered partnership with Genentech for RLY-1971
- Expanded approach from oncology to also include genetic diseases
- Created significant advantage by building extensive datasets and gaining experience

2021+

Deliver on Catalysts

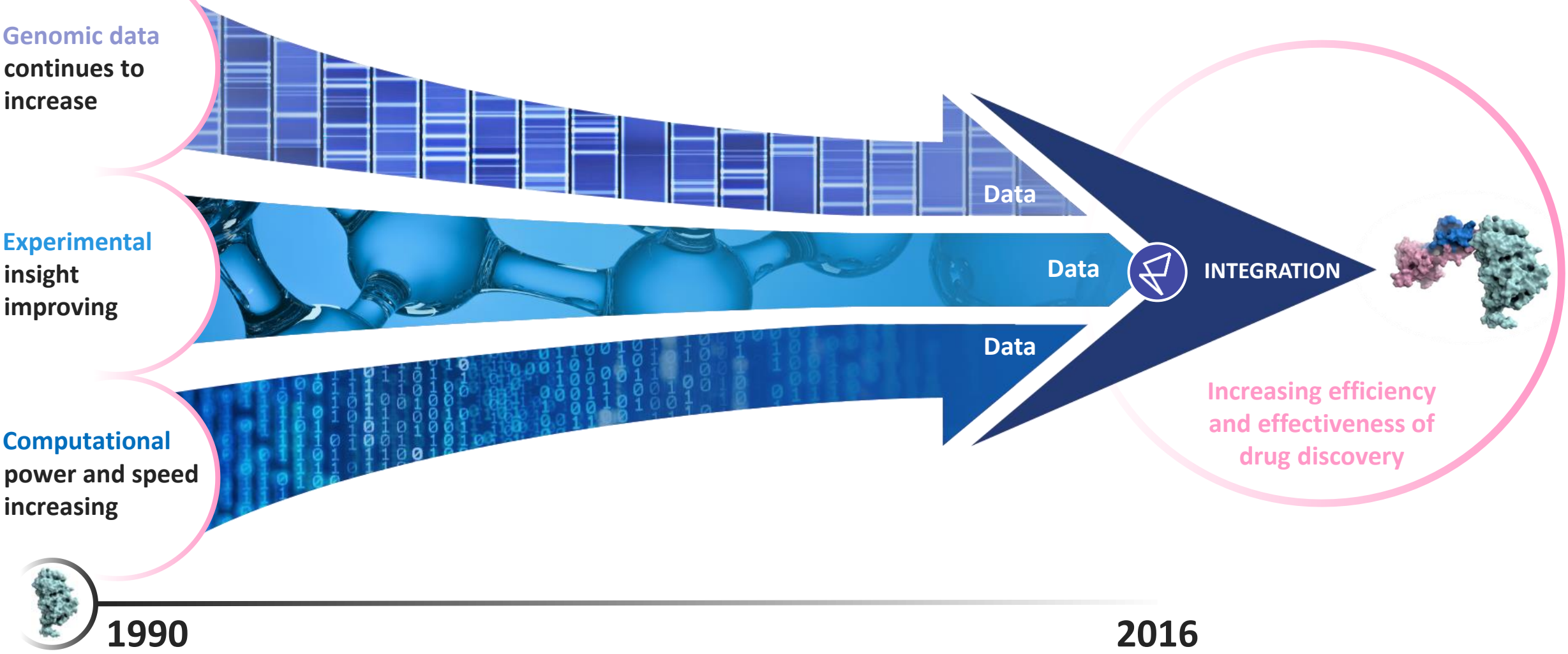
- Aim to achieve PoC across clinical / late pre-clinical programs
  - *RLY-4008, PI3Kα mutant selective, and RLY-1971 combinations*
- Advance additional precision medicines programs across multiple TAs into the clinic
- Continue to augment capabilities of Dynamo™ platform – through internal innovation, external collaboration and acquisition
  - *ZebiAI is the first example of platform augmentation through acquisition*

Relay Tx Created by the Nexus of 3 Unstoppable Forces and Data

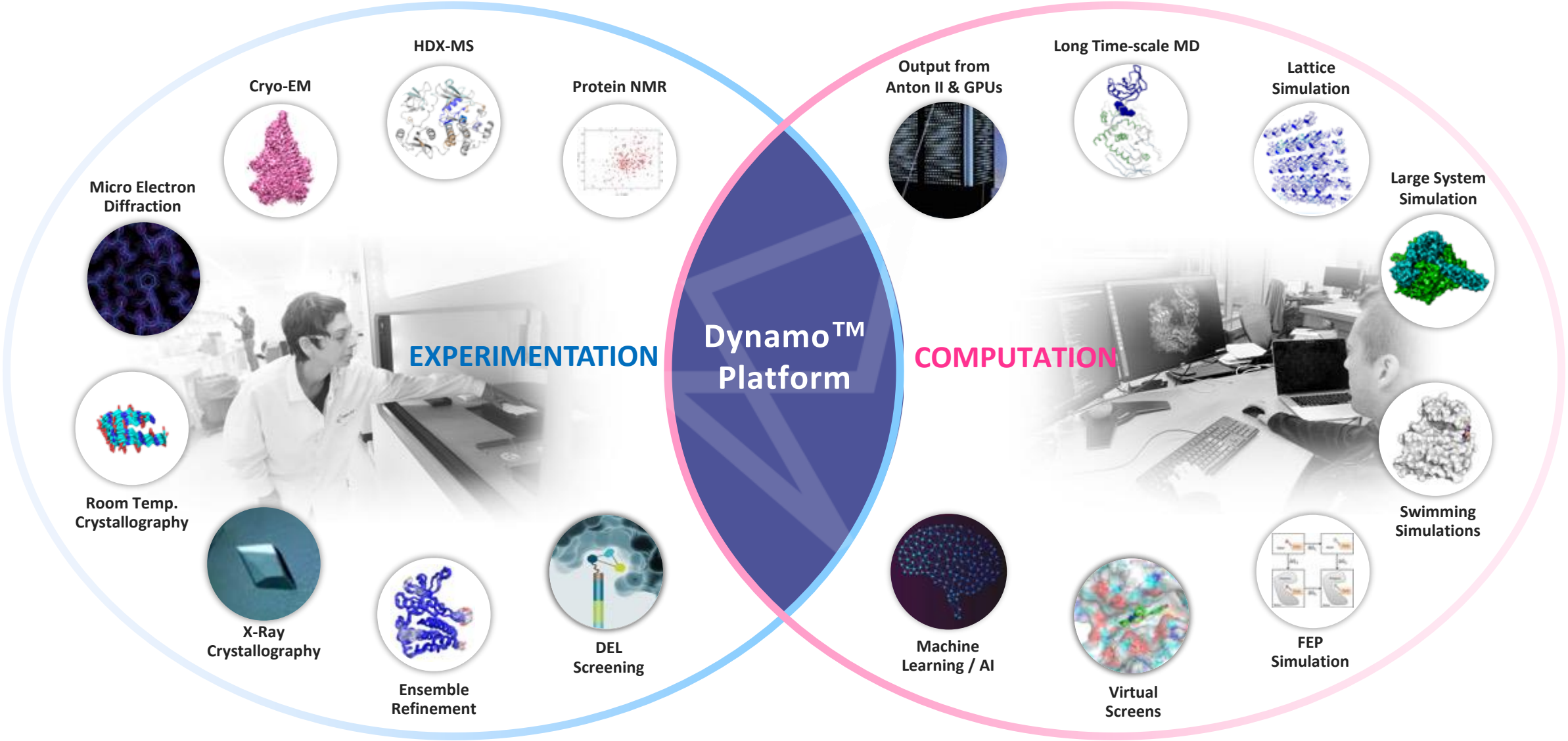
Genomic data continues to increase

Experimental insight improving

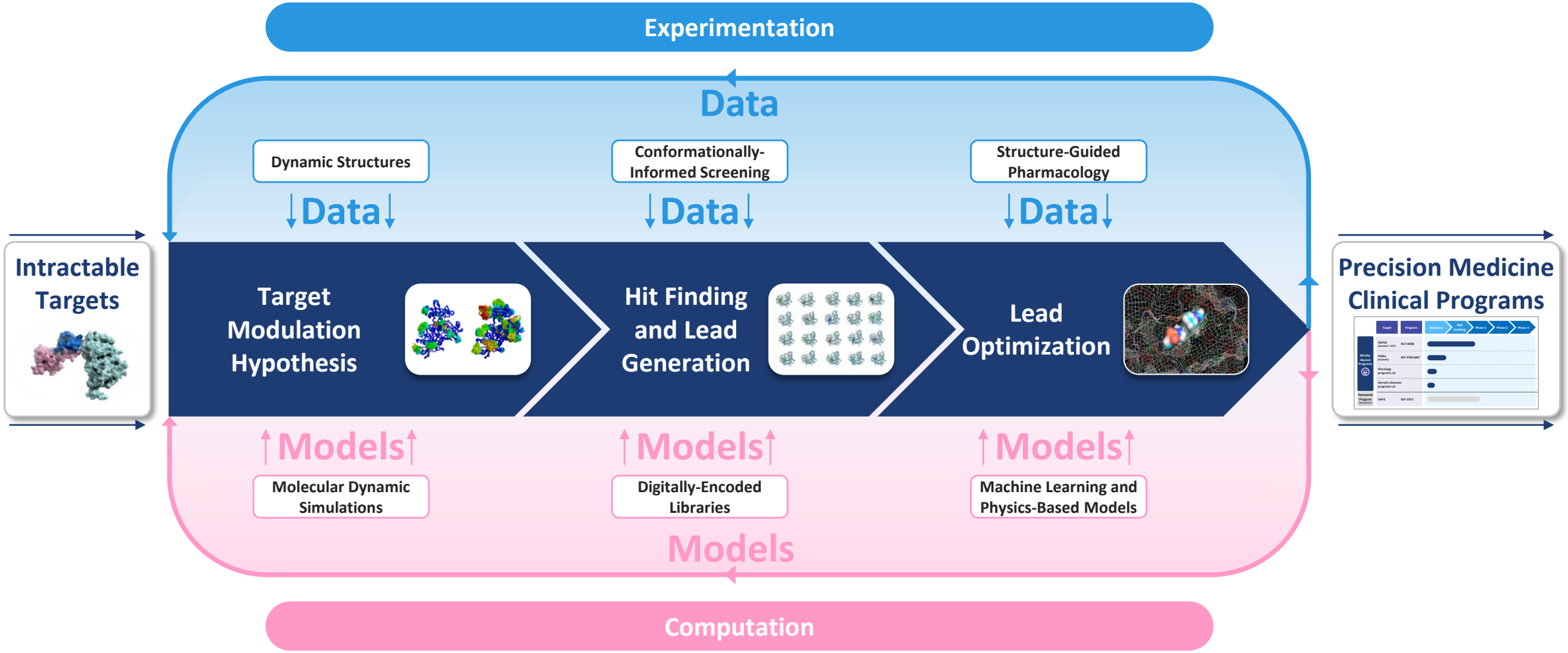
Computational power and speed increasing



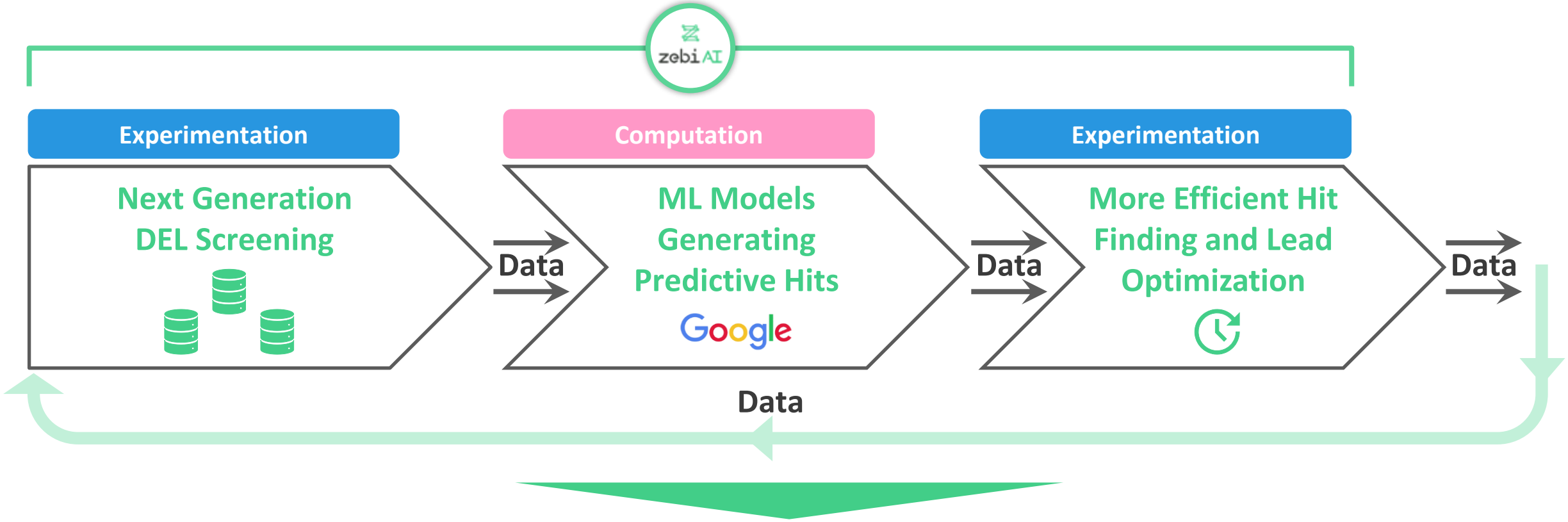
Relay Tx – Leader in Integrating Leading Edge Technologies



Relay Tx – We Have Validated Our Approach and Built Significant Advantage



ZebiAI – ML Driven DEL Screening Capability



Potential to:

- Increase efficiency and effectiveness of hit finding and lead generation
- Enhance and speed up lead optimization due to better drug-like starting points
- Broaden scope of chemical matter being evaluated

What Does ZebiAI Bring to Relay Tx?

Key ZebiAI Attributes

Experienced Team

Large Datasets

Industry Leading Collaborations
(Strategic Agreement with Leading DEL Provider, Collaboration with Google Accelerated Science)

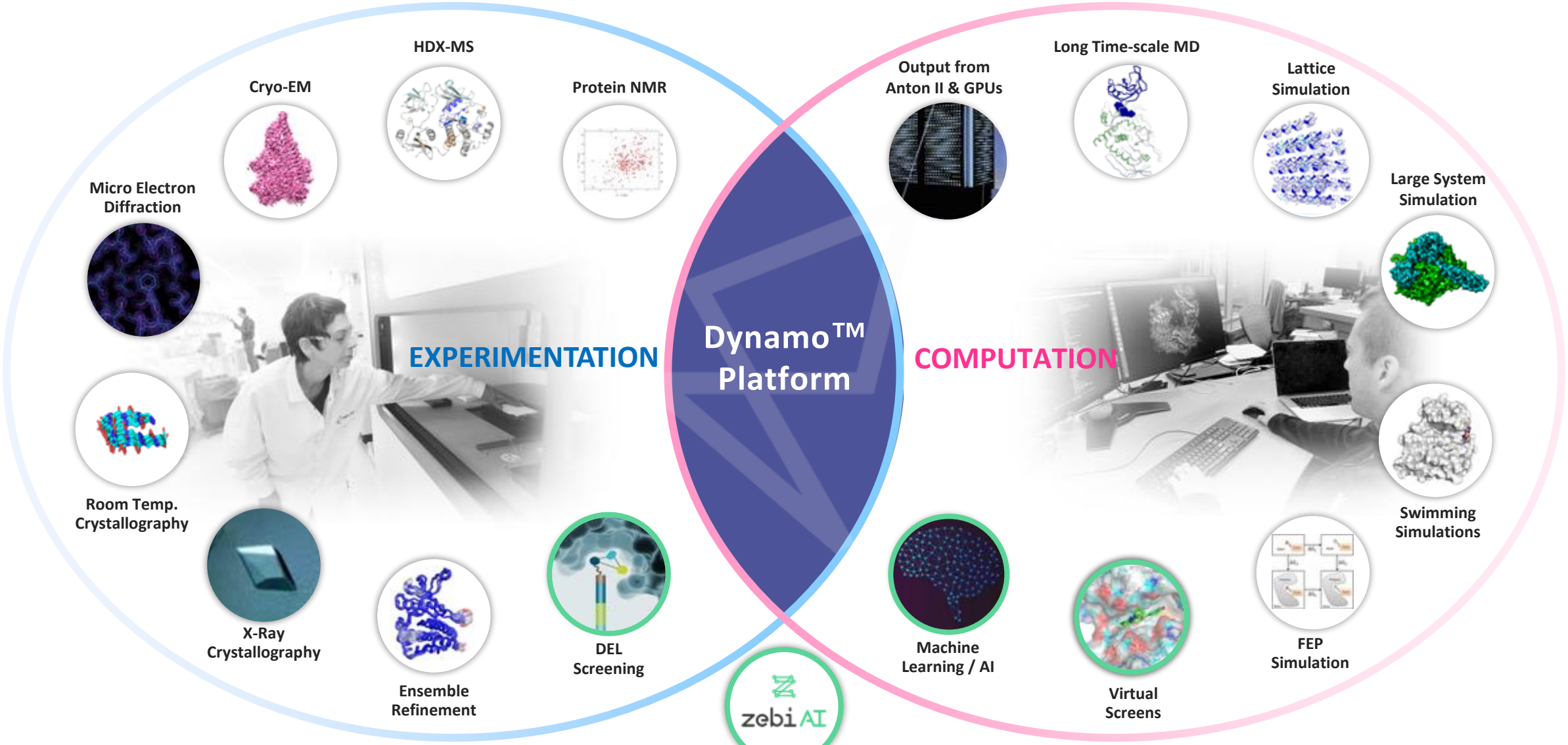
Chemome Initiative
(Cost-Effective Academic Research Partnerships, Bolstering Data/Models and Access to New Targets)

Validated ML-DEL Approach

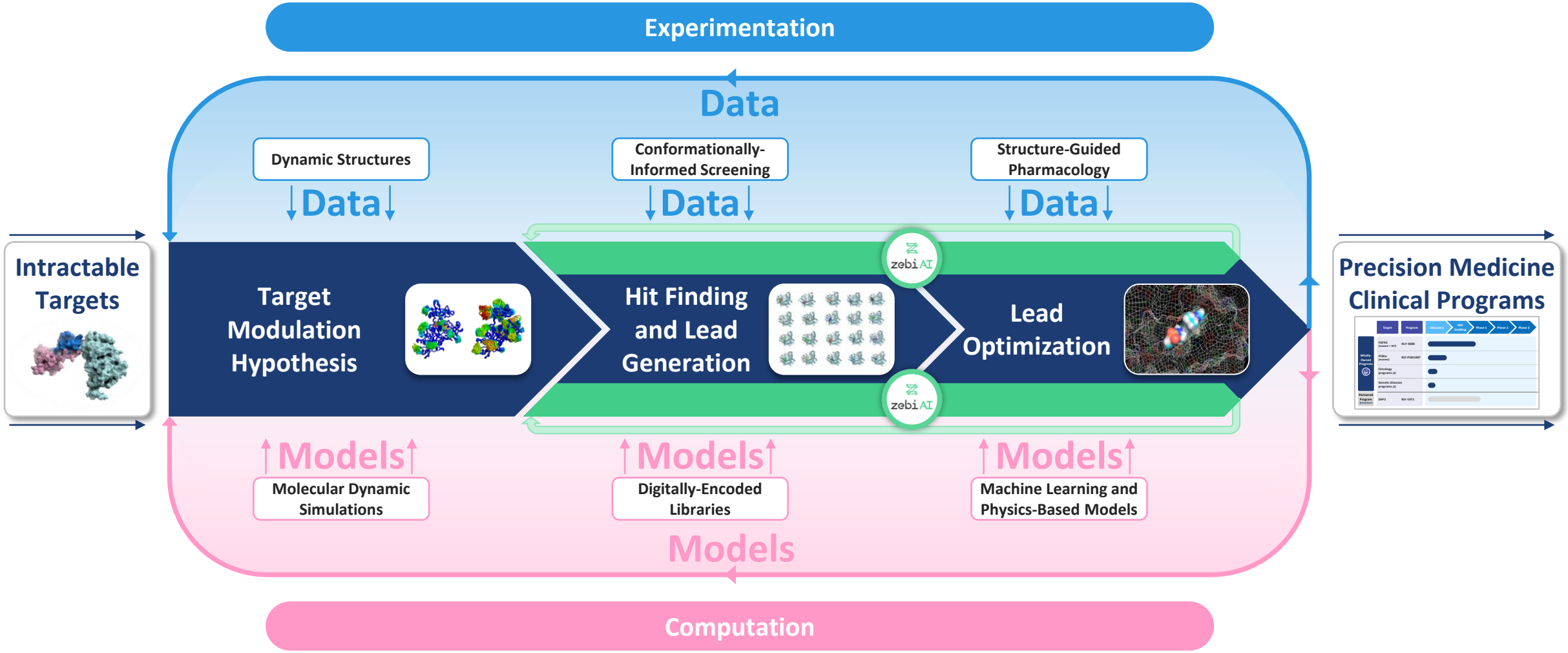
Complementary Vision

Source: McCloskey et al., J. Med. Chem.

Relay Tx – Aggregator of Emerging Technologies

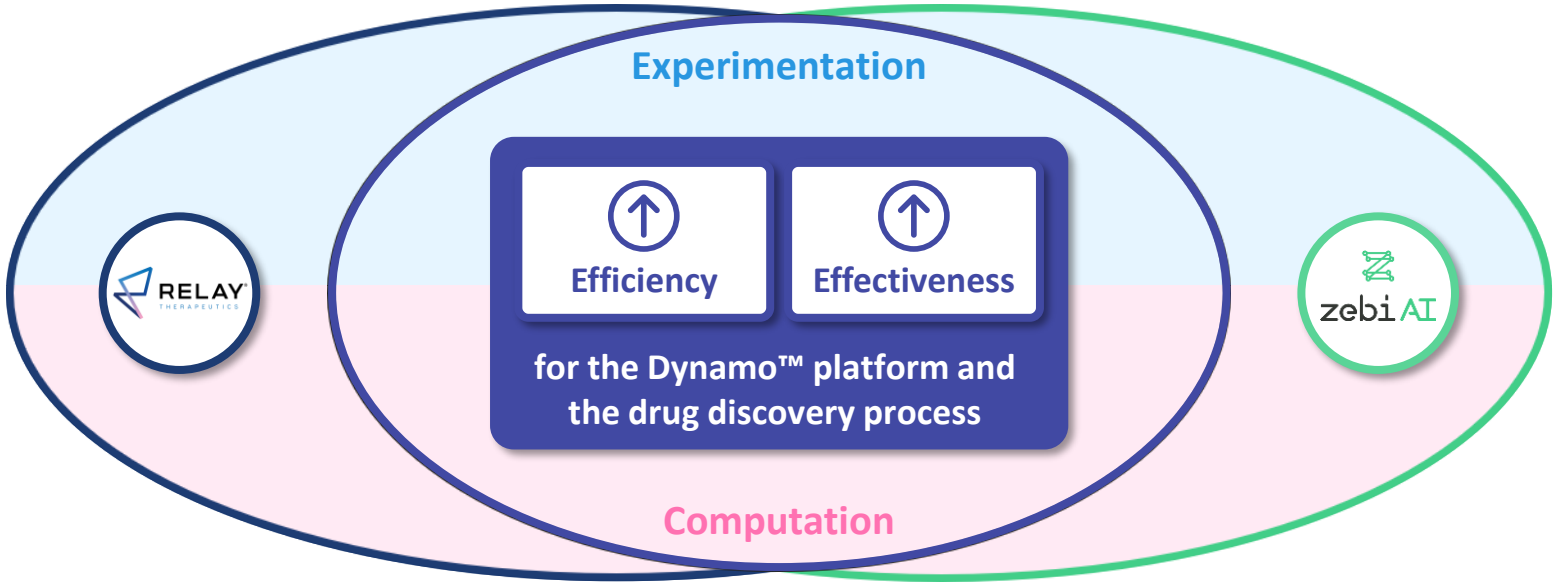


Relay Tx – ZebiAI Builds on Relay Tx's Strengths to Accelerate Our Capabilities



Augmenting the Dynamo™ Platform Through the Acquisition of ZebiAI

Extending Relay Tx's Leadership in Integrating Computational and Experimental Approaches to Create Precision Medicines



Upfront	Milestones	Other
$85M • $20M in cash • $65M in Relay Tx common stock	**Up to an additional $85M** • Platform and program-related milestones • Payable in Relay Tx common stock	**Up to an aggregate cap of $100M** • Eligible to receive 10% of the payments received within the next 3 years if Relay Tx enters partnering or collaboration agreements related to ZebiAI's platform • Payable in cash

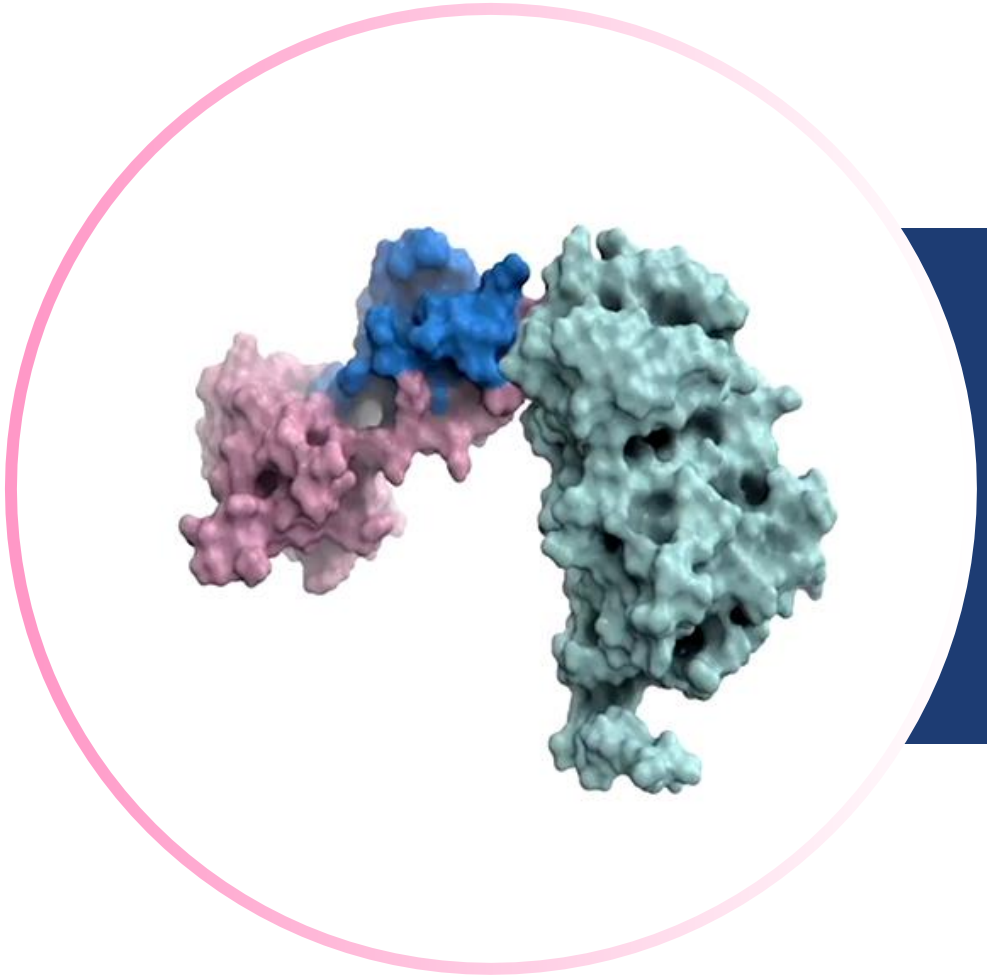
Dynamo™ Platform Offers Differentiated Benefits

Our Dynamo™ platform has promising potential…

- Effectively drug intractable targets
- Get patients the medicines they need faster
- Generate large amounts of data to continually enhance machine learning drug discovery
- Become the destination of choice for leading emerging technologies

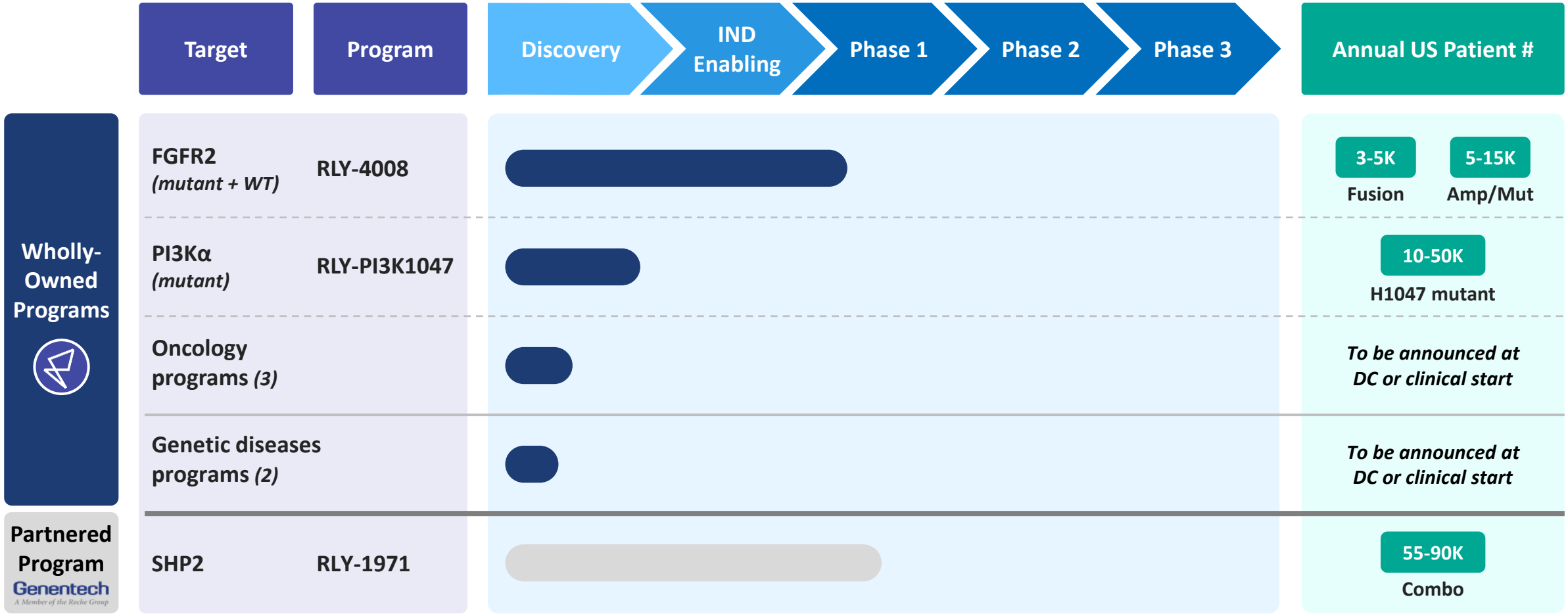
…and has been productive to-date

- **3** 2 clinical programs
  1 program expected to enter IND enabling studies in 2021
- **5** Pre-clinical programs
- **2** Therapeutic Areas:
  oncology and genetic diseases
- Ability to explore more TAs in the future



VALIDATION POTENTIAL

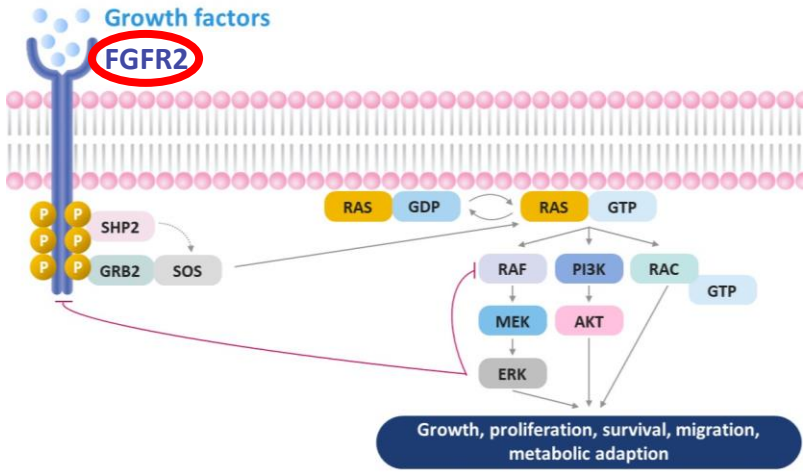
Our Product Pipeline



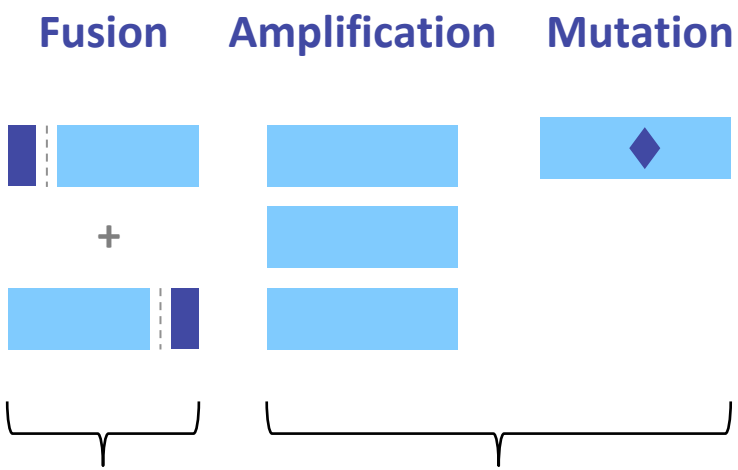
Note: Patient #'s refer to total annual number of US patients with late-line cancers compared to comprehensive annual incidence that may be amenable to treatment with our programs

FGFR2 – Validated Target Present in Several Tumor Types

Recurrently altered oncogene



3 main types of oncogenic drivers



~3K-5K patients in the US per year

~5K-15K patients in the US per year

FGFR2 alterations present in several solid tumor types

- ICC
- Endometrial
- Gastric
- Breast
- Other

Note: Alterations includes fusions and amplifications. ICC is intrahepatic cholangiocarcinoma. Patient #'s refer to total annual number of US patients with late-line cancers compared to comprehensive annual incidence that may be amenable to treatment with our programs.

FGFR2 – Selective Inhibitor Required to Overcome Pan-FGFRi Limitations

Compound	Company	Stage	FGFR2 selective	Response Rate	Dosing Schedule	% of Patients with Hyperphosphatemia[1]	% of Patients with Diarrhea	% of Patients Discontinued or Dose Reduced
Pemigatinib	Incyte	Approved	No	36% (ICC)	2 weeks on, 1 week off	94%	47%	23%
Infigratinib	QED therapeutics	Phase 2/3	No	24% (ICC)	3 weeks on, 1 week off	75%	25%	N.R.
Futibatinib	TAIHO ONCOLOGY, INC.	Phase 2/3	No	37% (ICC)	Once daily dosing	88%	37%	52%
Erdafitinib	janssen	Approved	No	32% (Urothelial Carcinoma)	Personalized dosing based on phosphate levels[2]	76%	47%	66%

[1]As defined by increased serum phosphate; except for infigratinib which is not specified
[2]Initial dose (8 mg QD) adjusted to 9 mg QD only in absence of hyperphosphatemia

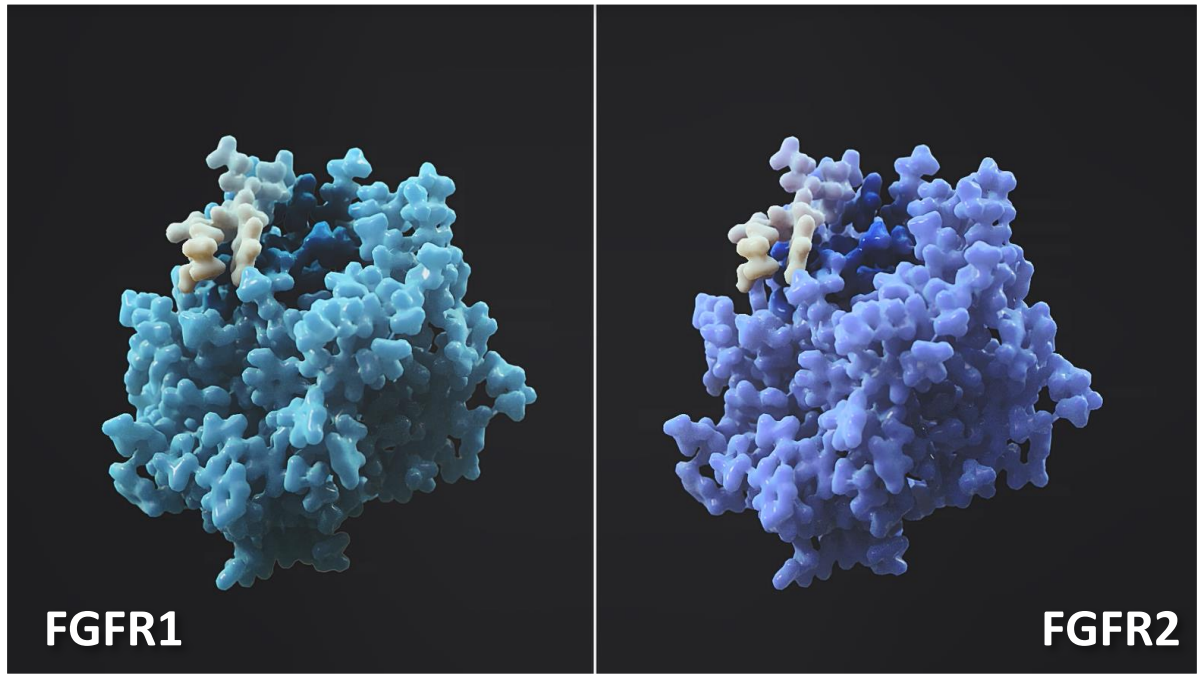
Discontinuous dosing and high toxicity limits efficacy of non-selective FGFR inhibitors

An FGFR2-selective molecule could enable more complete and durable target inhibition, resulting in greater efficacy with reduced toxicity

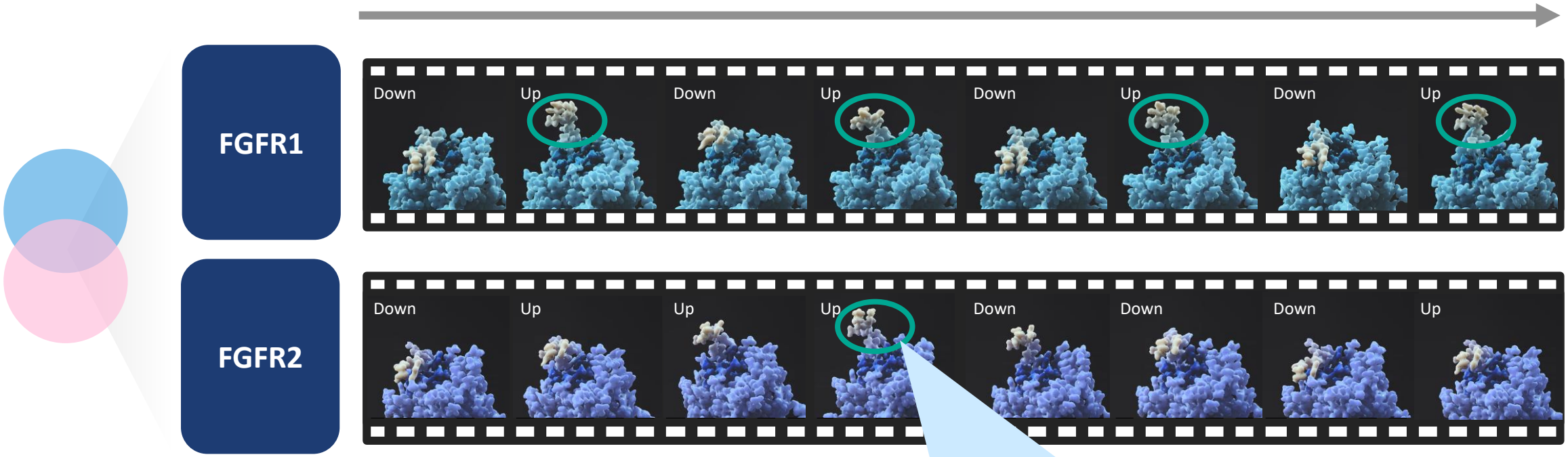
Sources: Pemigatinib – Prescribing information; Infigratinib – ASCO GI 2021; Futibatinib/TAS-120 – ASCO 2020; Erdafitinib – Prescribing information; N.R. = not reported

FGFR2 – Standard Approach to Discovery Has Had Limited Success

Standard Approach



FGFR2 – Increasing Experimental Resolution Reveals New Opportunities

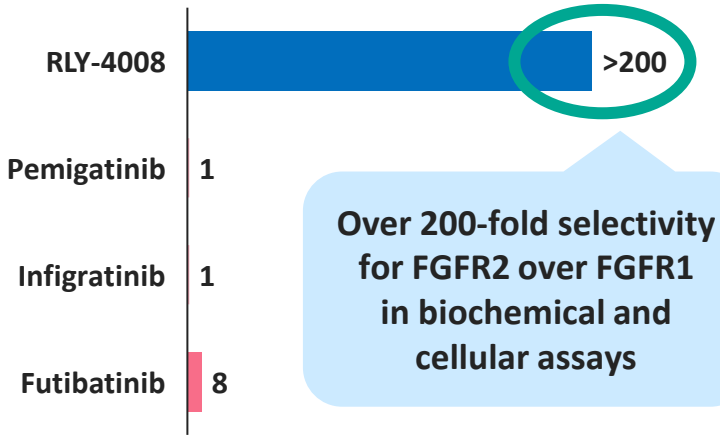


Exploiting the dynamic difference between FGFR1 and FGFR2 enabled Relay Tx to design a selective FGFR2 inhibitor

FGFR2 – Selectivity and Potency Observed with RLY-4008

Relay Tx compound is highly selective for FGFR2 over FGFR1

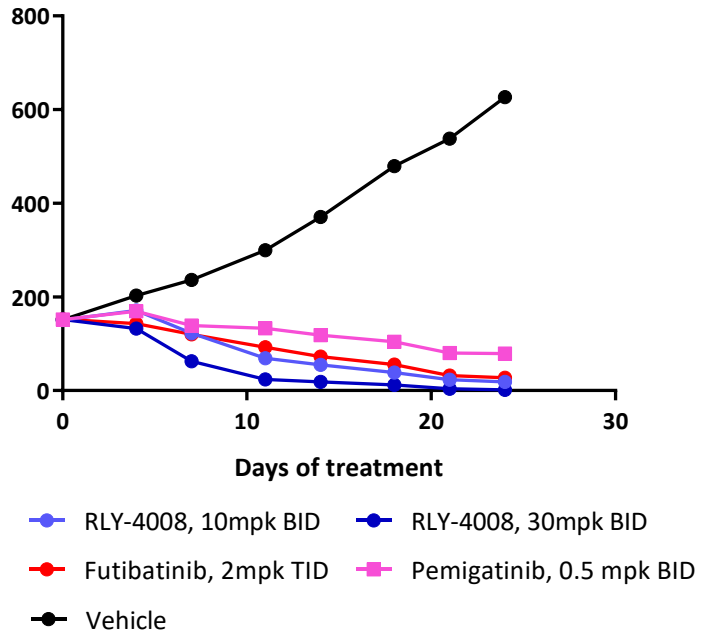
Fold selectivity FGFR2 over FGFR1



Over 200-fold selectivity for FGFR2 over FGFR1 in biochemical and cellular assays

Complete regression observed in vivo

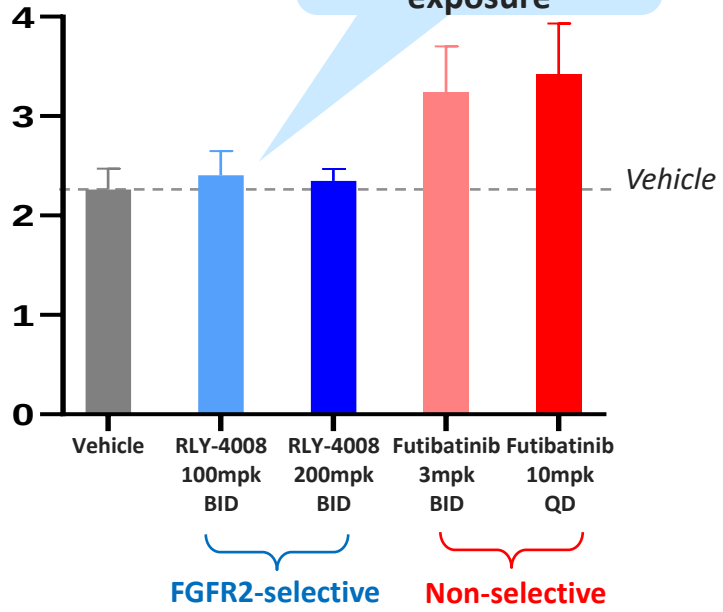
Tumor Volume (mm^3)*



No hyperphosphatemia observed preclinically

Serum Phosphate (mM)
(at day 14 of treatment)

RLY-4008 at doses exceeding efficacious exposure



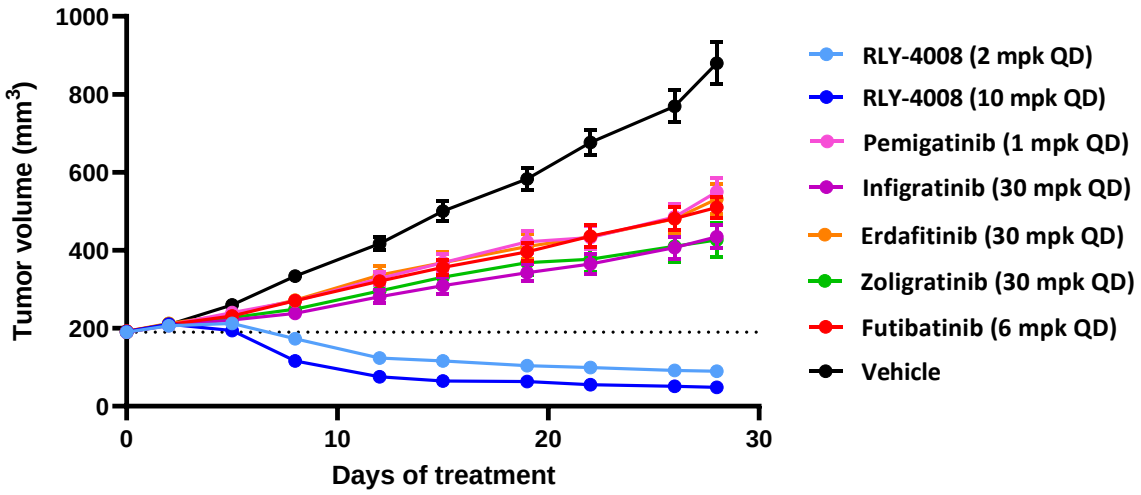
Hyperphosphatemia seen in competitor compound at doses needed for efficacious exposure

Note: Selectivity chart above shows biochemical selectivity. Cellular assay also shows >200 fold FGFR2 selectivity over FGFR1 for RLY-4008
* FGFR2-fusion intrahepatic cholangiocarcinoma ICC PDX Model

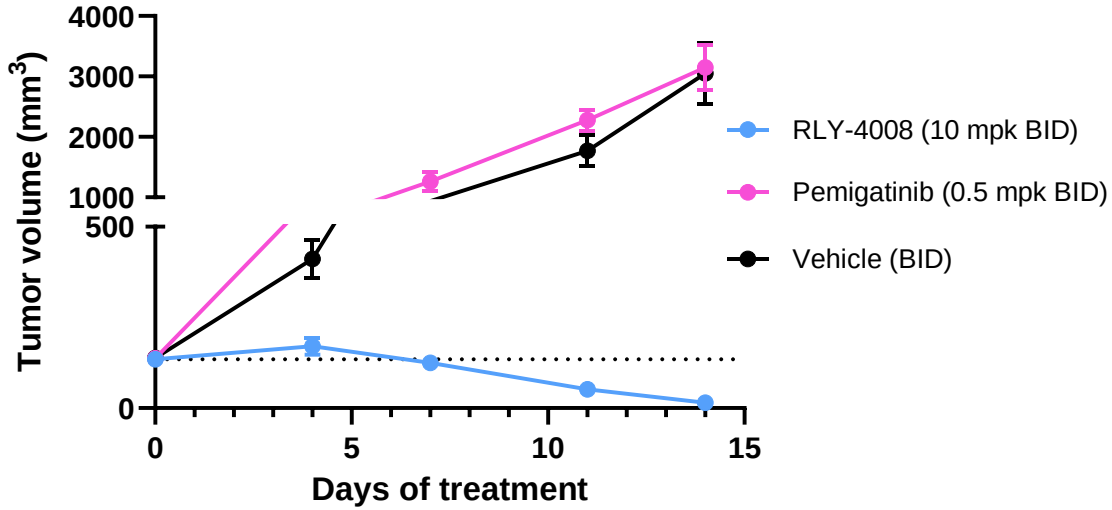
FGFR2 – RLY-4008 Retains Activity Against Resistance Mechanisms

Real world case series suggests two of the most commonly mutated sites in patients with acquired resistance to pan-FGFR inhibitors are V565 and N550

ICC FGFR2 fusion cancer PDX model with the V565F mutation



AN3CA endometrial cancer CDX model with the N550K mutation



Source: Goyal et al., ENA 2020

FGFR2 – Timeline and Clinical Plan

2021	2022+
Defining optimal dose and schedule	Obtaining initial proof of concept

Part 1: Dose Escalation

Enriched for FGFR2-altered solid tumors → MTD/RP2D

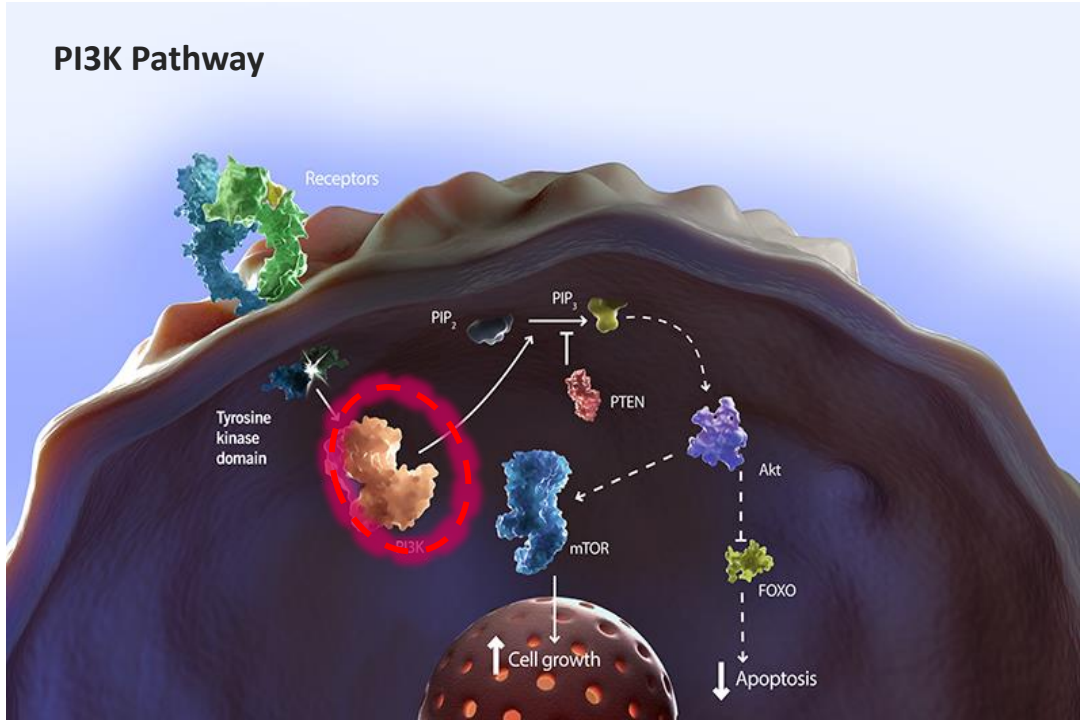
Part 2: Dose Expansion

- FGFR2-fusion+ ICC with prior FGFRi
- FGFR2-fusion+ ICC with no prior FGFRi
- FGFR2-fusion+, non-ICC
- FGFR2-amplified
- FGFR2-mutant

Preclinical presentation at AACR followed by initial clinical data anticipated in 2H 2021

PI3Kα – Mutant-Selective Drug Represents Significant Clinical Opportunity

PI3Kα is the most frequently mutated kinase in cancer



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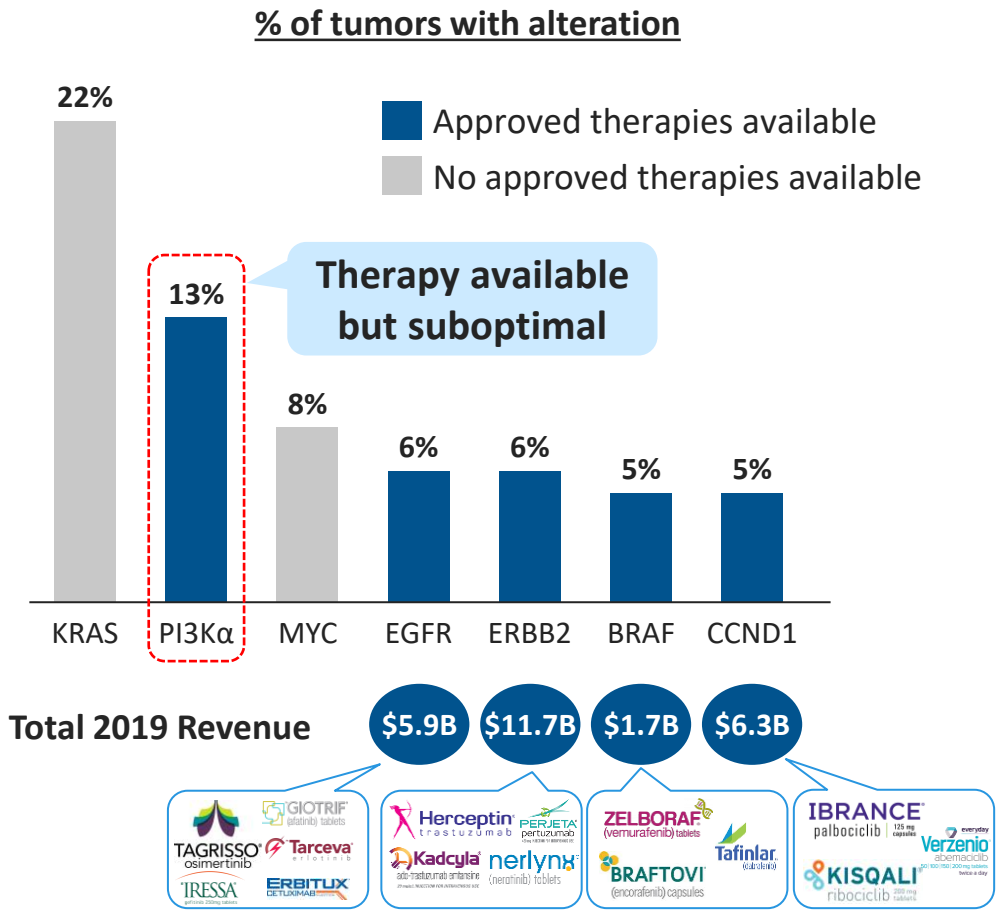
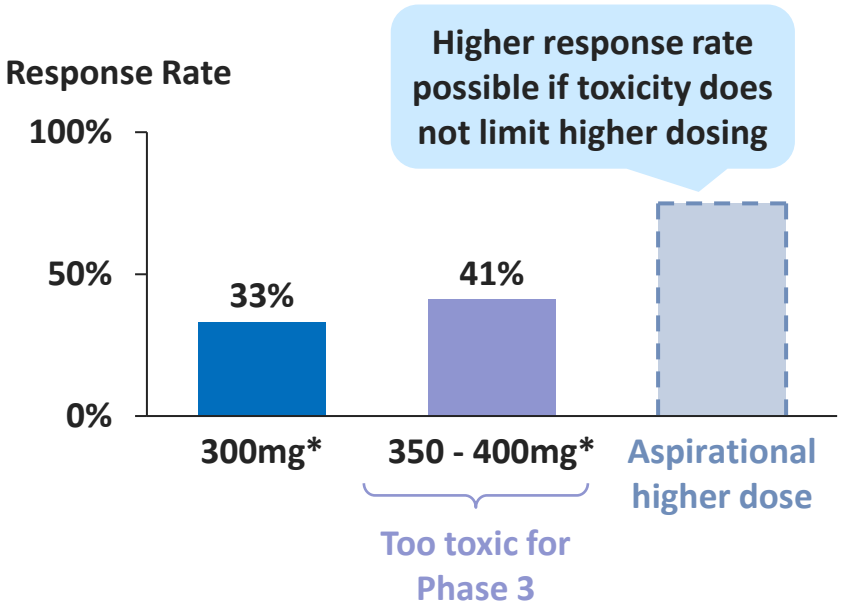


PI3Kα – Existing Inhibitors Have Limited Therapeutic Window

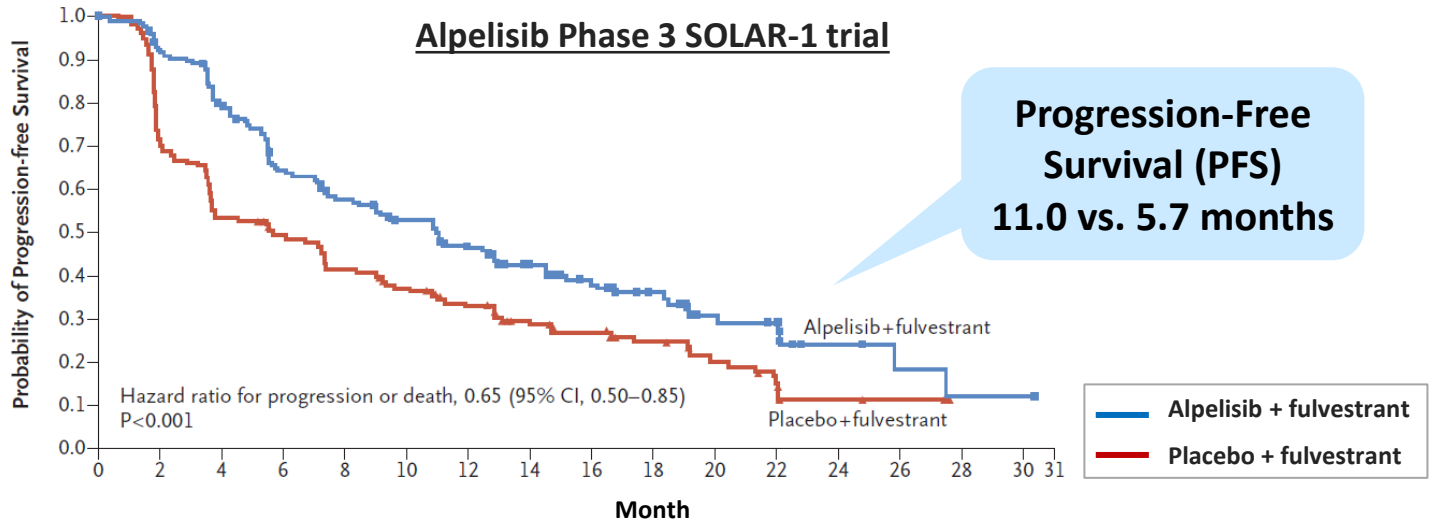
Validated oncogene target, with higher doses leading to better efficacy…

Alpelisib Phase 1b dose escalation (combined with fulvestrant)



…however, efficacy of non-mutant-selective PI3Kα inhibitor limited by toxicity

Alpelisib Phase 3 SOLAR-1 trial



Progression-Free Survival (PFS) 11.0 vs. 5.7 months

Significant toxicity:

- Dose reduction/interruption: **64%** of patients
- Discontinuation due to adverse events: **25%**
- Hyperglycemia: **64% (37% Grade 3/4)**
- GI toxicity: **93% (9% Grade 3)**
- Rash: **36% (10% Grade 3)**

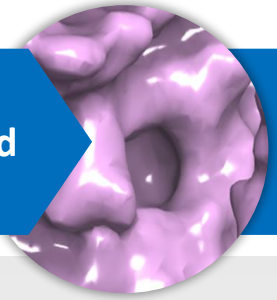
Median duration of exposure to alpelisib: 5.5 months

Sources: Juric et al., JAMA Oncology and André et al., NEJM

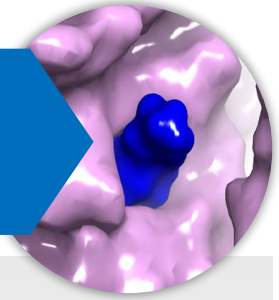
PI3Kα – Proprietary Insights Unlock Additional Approaches

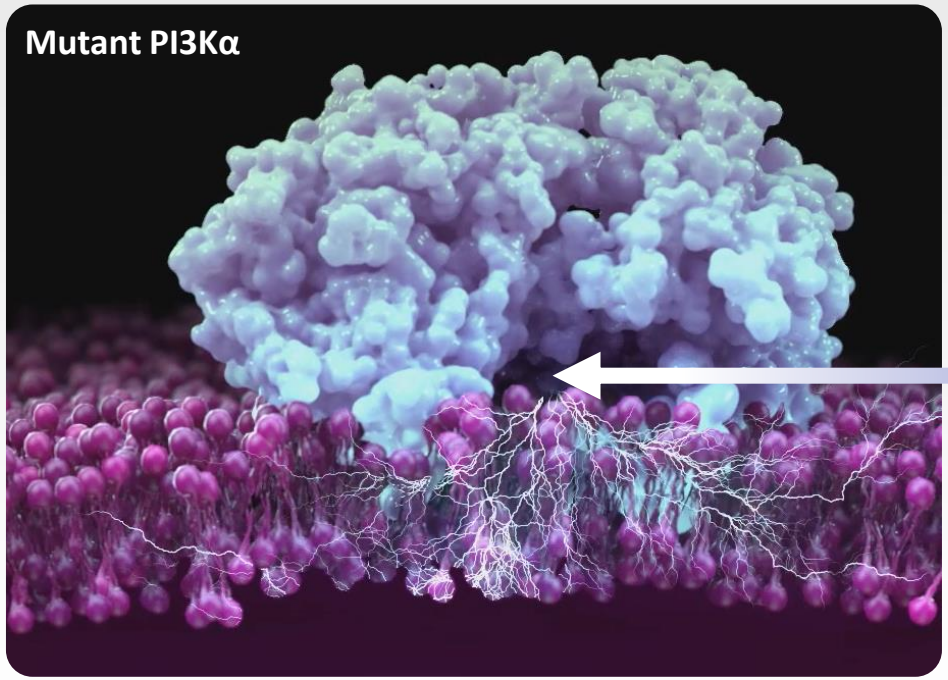
Solved first full-length structures of PI3Kα (mutant and wild-type)

Discovered novel allosteric pocket favored in mutant protein



Designed mutant selective PI3Kα inhibitor

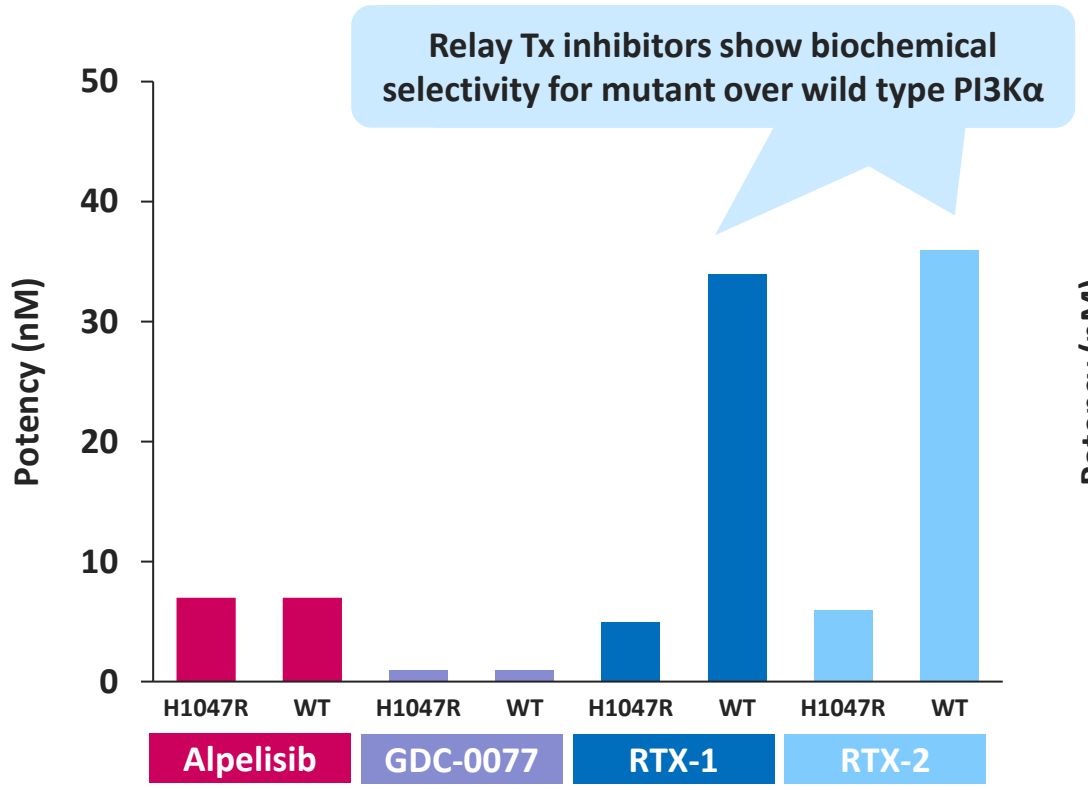




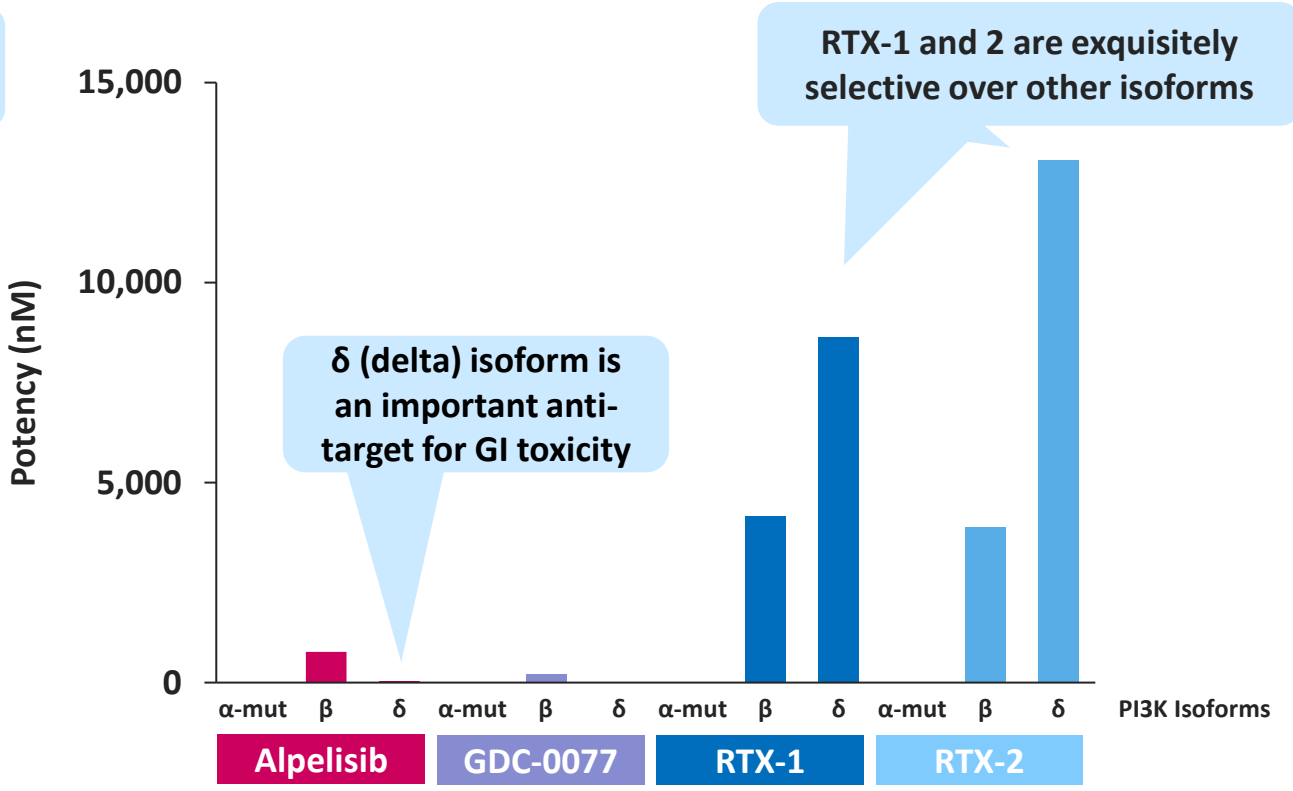
A differentiated understanding of the structure of PI3Kα and its relationship to function equips Relay Tx to design optimal mutant-selective inhibitors of PI3Kα

PI3Kα – RTX Compounds Show Isoform and Mutant Biochemical Selectivity

Mutant vs. WT PI3Kα potency



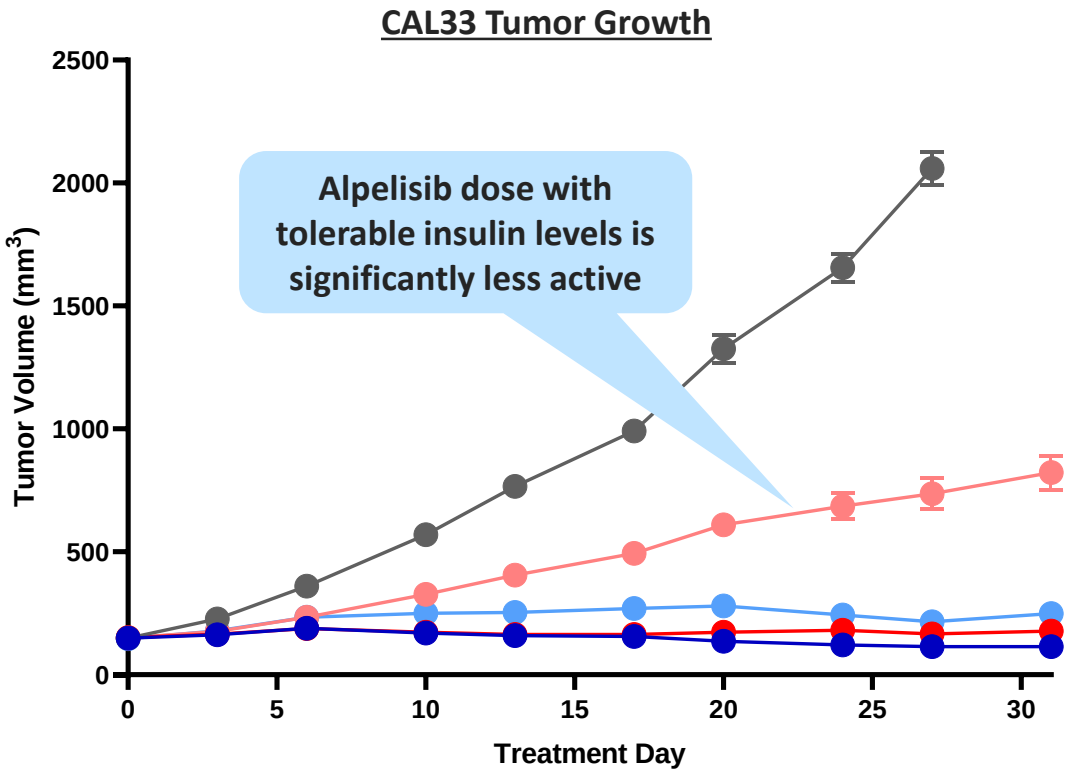
H1047R mutant PI3Kα vs. other isoform potency

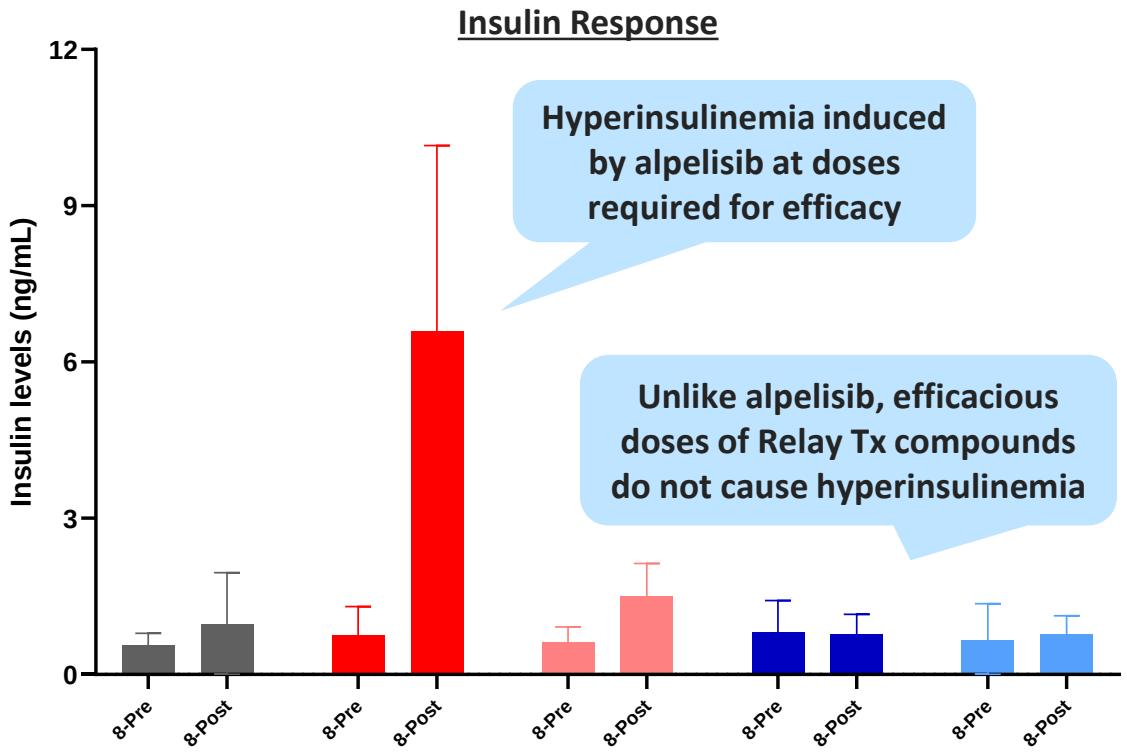


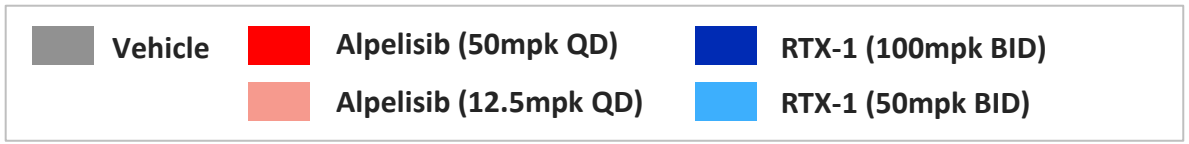
PI3Kα – In Vivo Tumor Growth Inhibition With Minimal Increases in Insulin Levels

Significant anti-tumor activity in PI3K mutant mouse xenograft model…

…With minimal increases in serum insulin levels for Relay Tx Compound

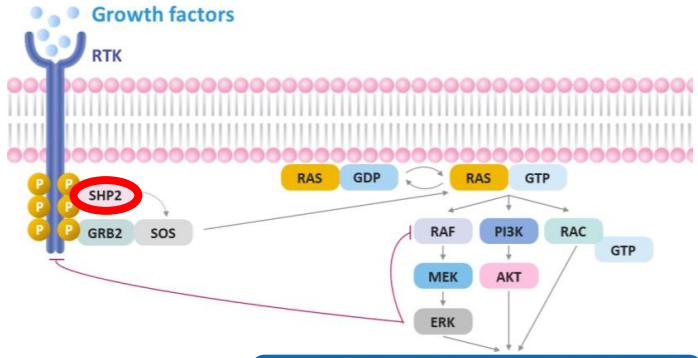






SHP2 – RLY-1971 Is Potent and Selective with Potential for Multiple Combinations

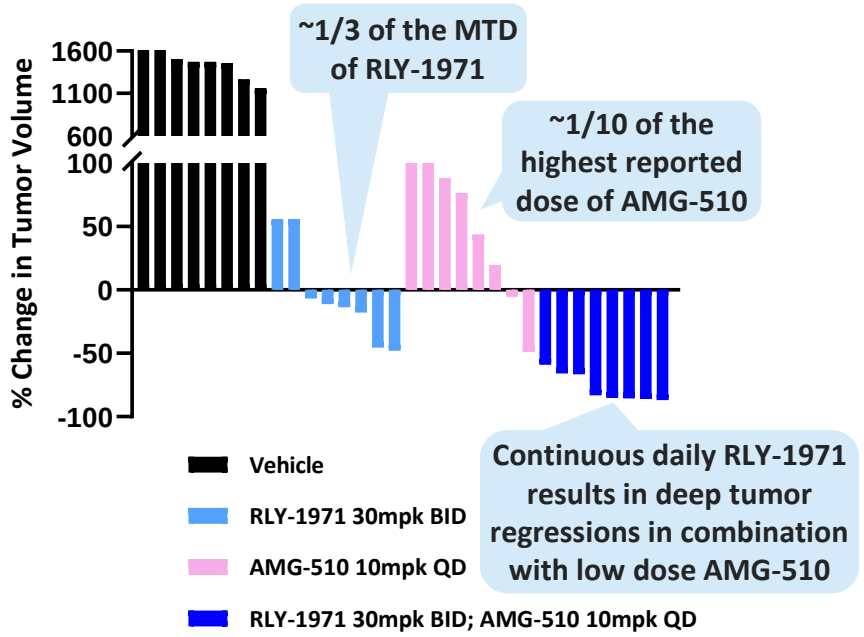
SHP2 is a rational combination partner for a number of therapies



Growth, proliferation, survival, migration, metabolic adaptation

KRAS G12C xenograft + KRAS G12Ci

NCI-H358 cell line



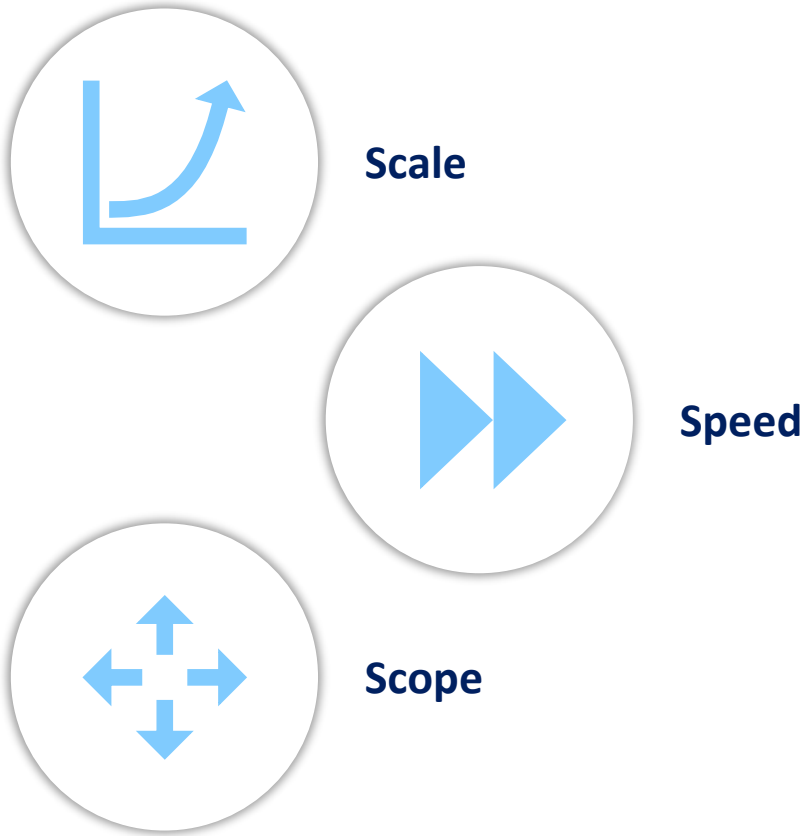
Key differentiating features of RLY-1971

Dosing potential	Projected to be continuous once daily dosing
Potency	Demonstrated 750pM IC50 inhibition of SHP2 in biochemical assays
Novel chemistry	Chemically distinct from other SHP2 inhibitors

RLY-1971 and GDC-6036 (KRAS G12C) combination trial expected to start in 2021

SHP2 – Genentech Global Collaboration for RLY-1971

For the development and commercialization of RLY-1971, the collaboration increases…



Collaboration also provides meaningful economics to Relay Tx

Exclusive license

$75M upfront + $25M in potential near-term payments

Up to $695M in additional total milestones

Low-to-mid teen royalties on global net sales

Eligible to receive additional royalties upon approval of RLY-1971 and GDC-6036 in combination

Opt-in option

50-50 US profit share

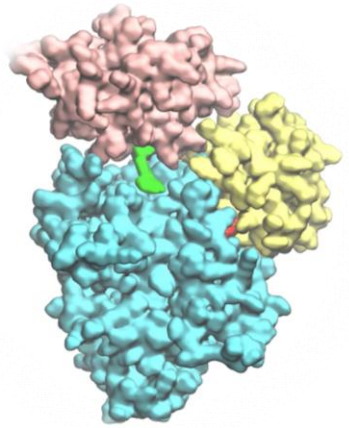
Target Selection Focused on High Value, Low Translational Risk Opportunities

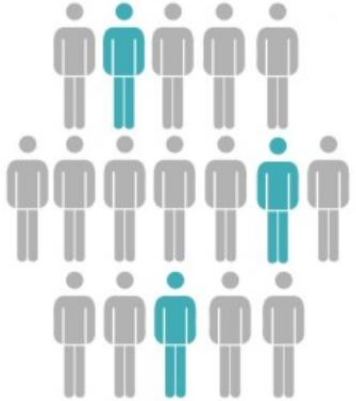
Target is a driver of disease

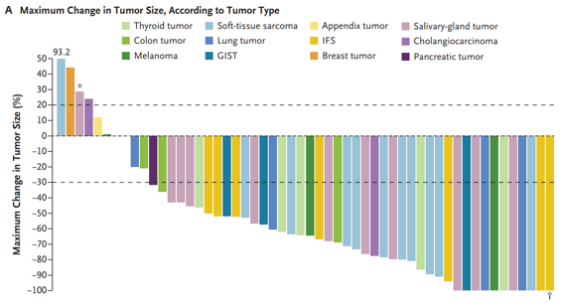
Amenable to Relay Tx's Dynamo™ platform

Clear patient selection strategy

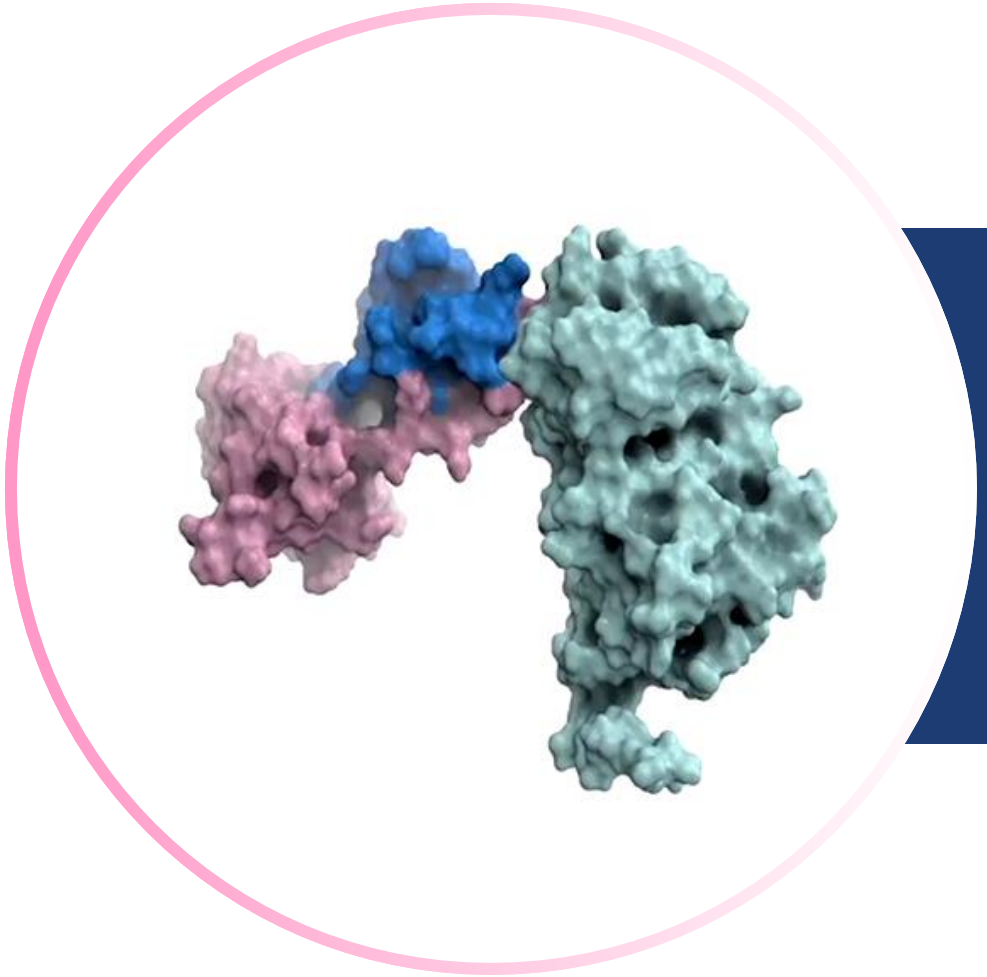
Rapid path to clinical POC







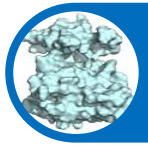
Initial focus on cancer, expanded to genetic diseases with 2 active programs



VALIDATION POTENTIAL

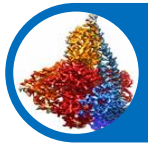
What To Expect From Relay Tx

Nearer-term milestones



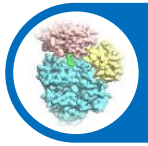
RLY-4008 (FGFR2)

Preclinical presentation at AACR
Clinical update expected in 2H 2021



RLY-PI3K1047 (PI3Kα)

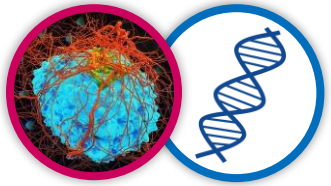
IND enabling studies expected in 2021



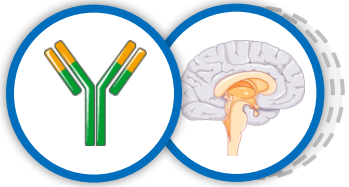
RLY-1971 (SHP2)

GDC-6036 (KRAS G12C) combo trial expected to start in 2021

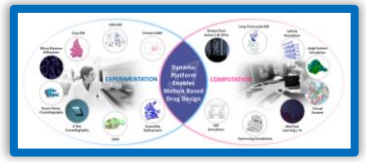
Medium-/longer-term drivers



5 additional ongoing pre-clinical programs in precision oncology and genetic diseases



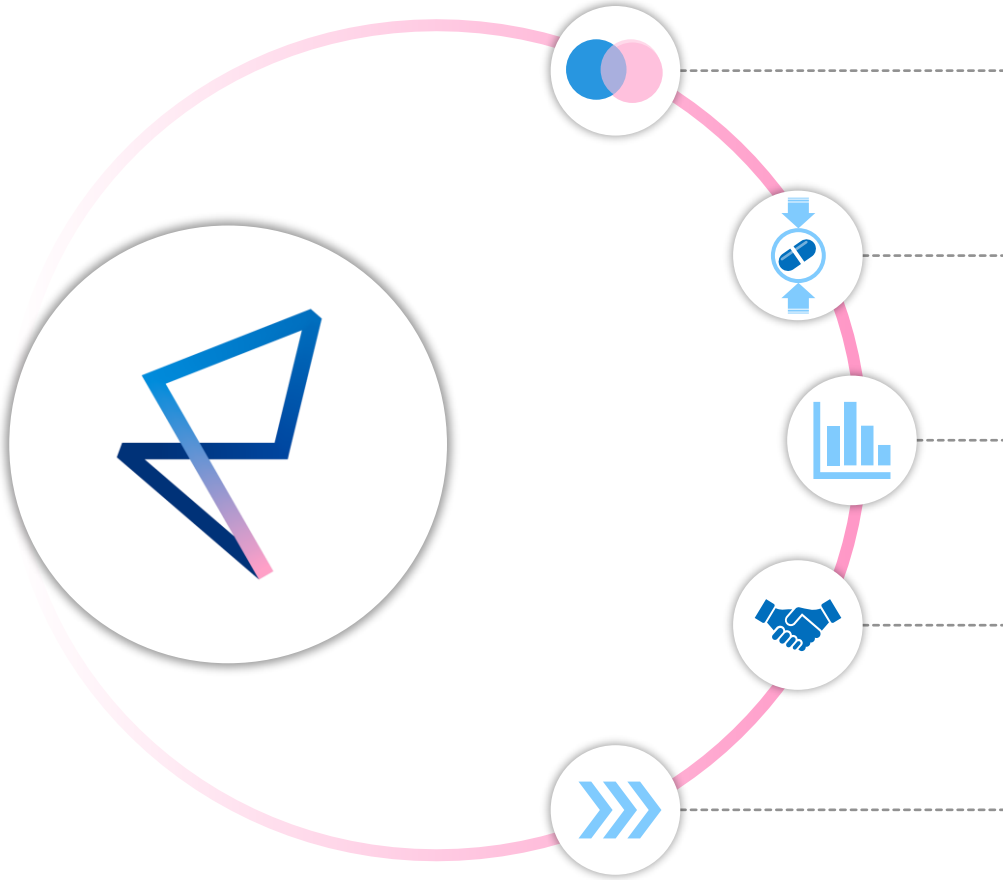
Future opportunities in other TAs
e.g., immunology, neuroscience



Continued evolution of our Dynamo™ platform, with ZebiAI as the first example of platform augmentation through acquisition

$678M Cash & cash equivalents as of the end of Q4 2020
(not including the $75M in upfront from Genentech collaboration)

Relay Tx – The Start of a New Paradigm



- Dynamo™ Platform generates novel drug discovery insights and continues to evolve, with ZebiAI as the first acquisition example
- Relay Tx approach validated with 2 programs in the clinic
- RLY-4008 data in 2H 2021 expected to potentially be first demonstration of clinical differentiation for a Dynamo™ Platform molecule
- Genentech global collaboration for RLY-1971 strengthens development and commercialization path forward
- Robust pre-clinical precision medicines pipeline with PI3Kα, 3 additional oncology programs and 2 genetic diseases programs