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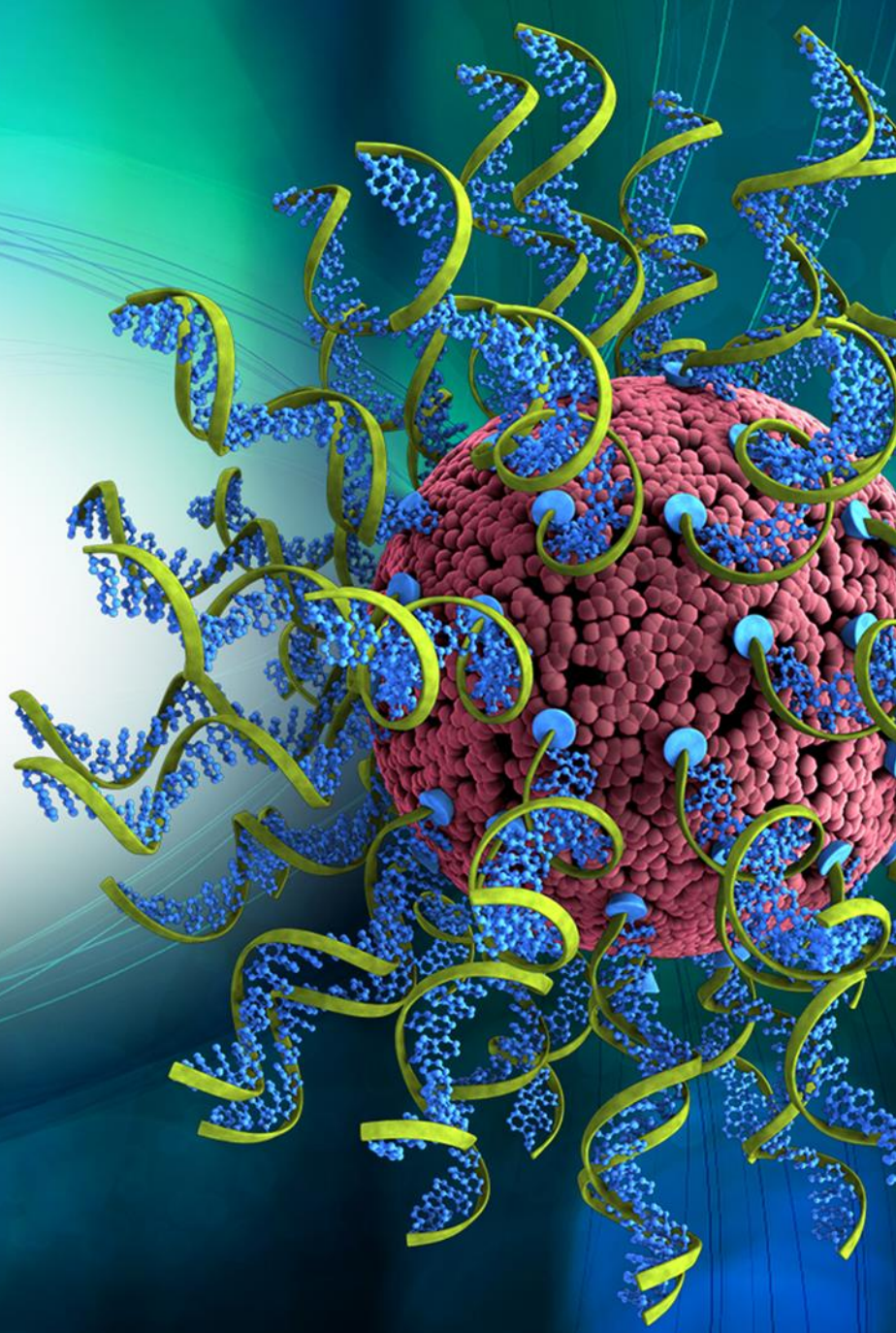
Corporate Presentation
March 4, 2020



@exicure
Nasdaq: XCUR

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This presentation contains forward-looking statements. All statements other than statements of historical facts contained in this presentation, including statements regarding our future results of operations, business strategy, current and prospective product candidates, results of ongoing clinical trials, planned clinical trials and preclinical activities, product approvals, timing and likelihood of success, plans and objectives of management for future operations, future results of anticipated product candidates, current or planned collaborations, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risks and uncertainties may emerge from time to time, and it is not possible for management to predict all risks and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise.

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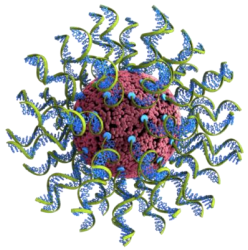
Exicure is developing nucleic acid therapeutics based on our proprietary Spherical Nucleic Acid (SNA) technology

- **GROWING DEVELOPMENT PIPELINE**
  - Developing XCUR-FXN for Friedreich's ataxia; IND-enabling studies expected to begin late 2020
  - Expect to commence two Phase 2 trials with AST-008 in Q2-2020 in Merkel cell carcinoma and in cutaneous squamous cell carcinoma
  - Partnership with Allergan for hair loss disorders
  - Partnership with Dermelix for Netherton syndrome
  - Expanding preclinical activities in neurology and ophthalmology
- **BETTER UPTAKE, GREATER STABILITY**
  - 3-D architecture drives better uptake and greater stability
  - Preclinically demonstrated local delivery in CNS, eye, GI tract, liver, lung, skin
  - Applicable for antisense, siRNA, TLR9 modulators, splice-switching approaches
- **ROBUST IP & FINANCIAL POSITION**
  - 85+ patents issued or allowed; 125+ pending patent applications
  - $110.8 MM reported cash at 12/31/19



Spherical Nucleic Acids: a proprietary technology platform

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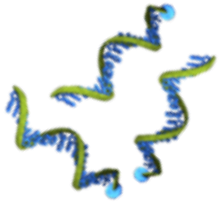
SNAs are dense, radial arrangements of synthetic nucleic acids on a nanoparticle



Synthetic nucleic acid therapeutics

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Benign lipid nanoparticle scaffold

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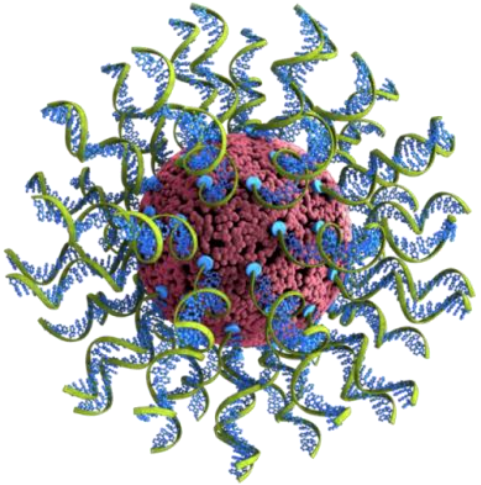
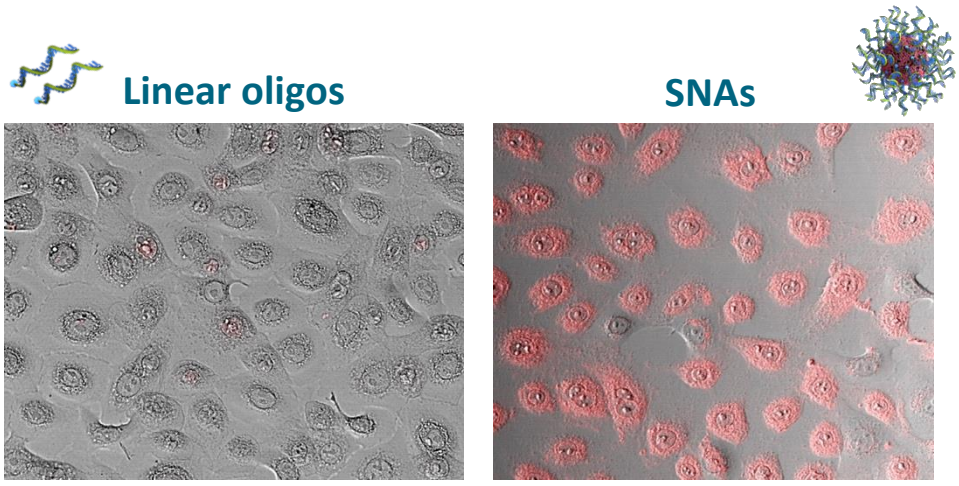


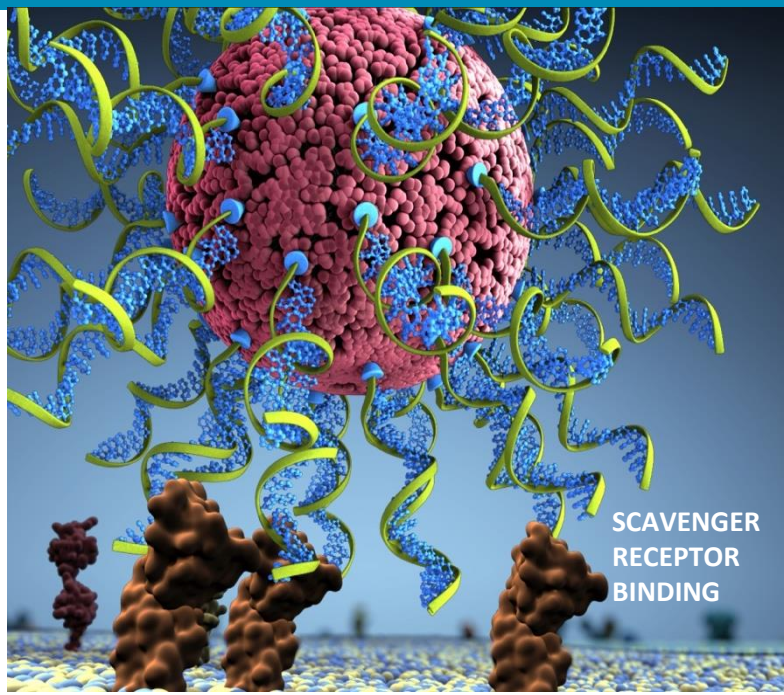
SNAs are able to utilize these therapeutic modalities:

- Antisense
- siRNA
- TLR9 activation
- Splice-switching

SNA technology is uniquely differentiated

Unlike linear oligos, SNAs enter cells via ubiquitous scavenger receptors



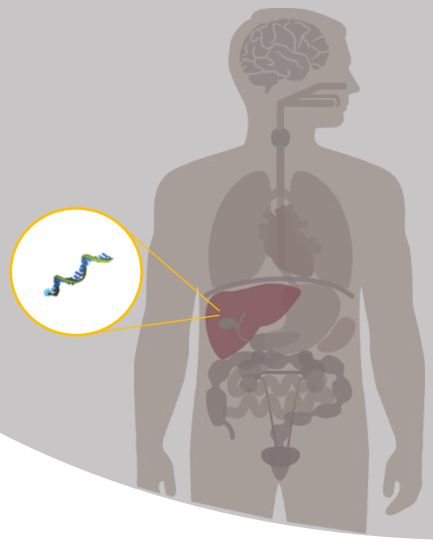


- **Key Benefits: High Cell Uptake; Extra-hepatic Delivery; Enhanced Stability**
  - SNAs have high cell uptake without encapsulation or complexation *in vitro*[1]
  - Extra-hepatic delivery shown for SNAs in humans[2] and mice (*in vivo*)[3]
  - Extended therapeutic half-life of SNAs *in vitro* = enhanced stability inside cells[4]

[1]*PNAS*, **2013**, *110*, p7625; [2]Company data with AST-005 and XCUR17 clinical trials; [3]*PNAS*, **2012**, *109*, p11975; [4]*Science*, **2006**, *312*, p1027

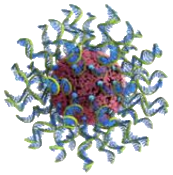
SNA technology enables localized delivery

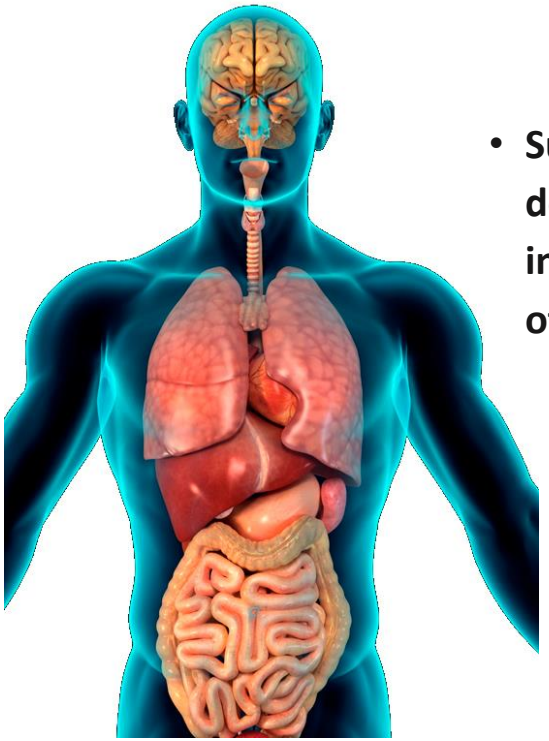
Traditional oligo therapies face substantial delivery challenges...



Linear oligos delivered systematically are rapidly cleared into the liver and often chemically modified for stability

SNAs are delivered locally or topically to target tissue

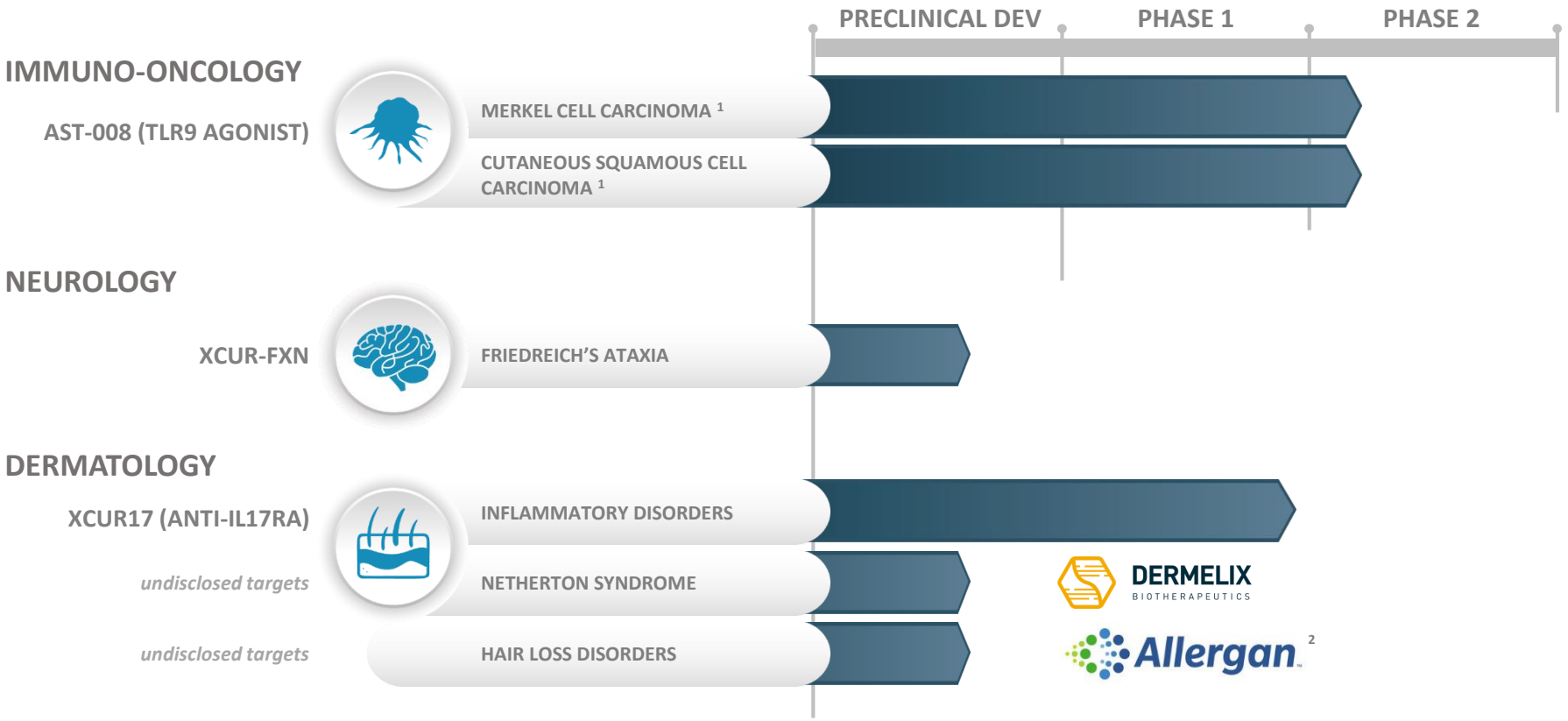




- **Successful local delivery achieved in animal models of:**
  - CNS
  - Eye
  - Skin
  - GI tract
  - Lung
  - Liver

SNA technology allows nucleic acids to be delivered to local sites throughout the body, expanding the potential application of nucleic acid therapeutics

Development pipeline



[1] In combination with checkpoint inhibitors

[2] On October 14, 2019, the shareholders of Allergan plc voted to approve the acquisition of Allergan by AbbVie Inc., which is expected to close in the first quarter of 2020 and is subject to customary regulatory approvals and other customary closing conditions.

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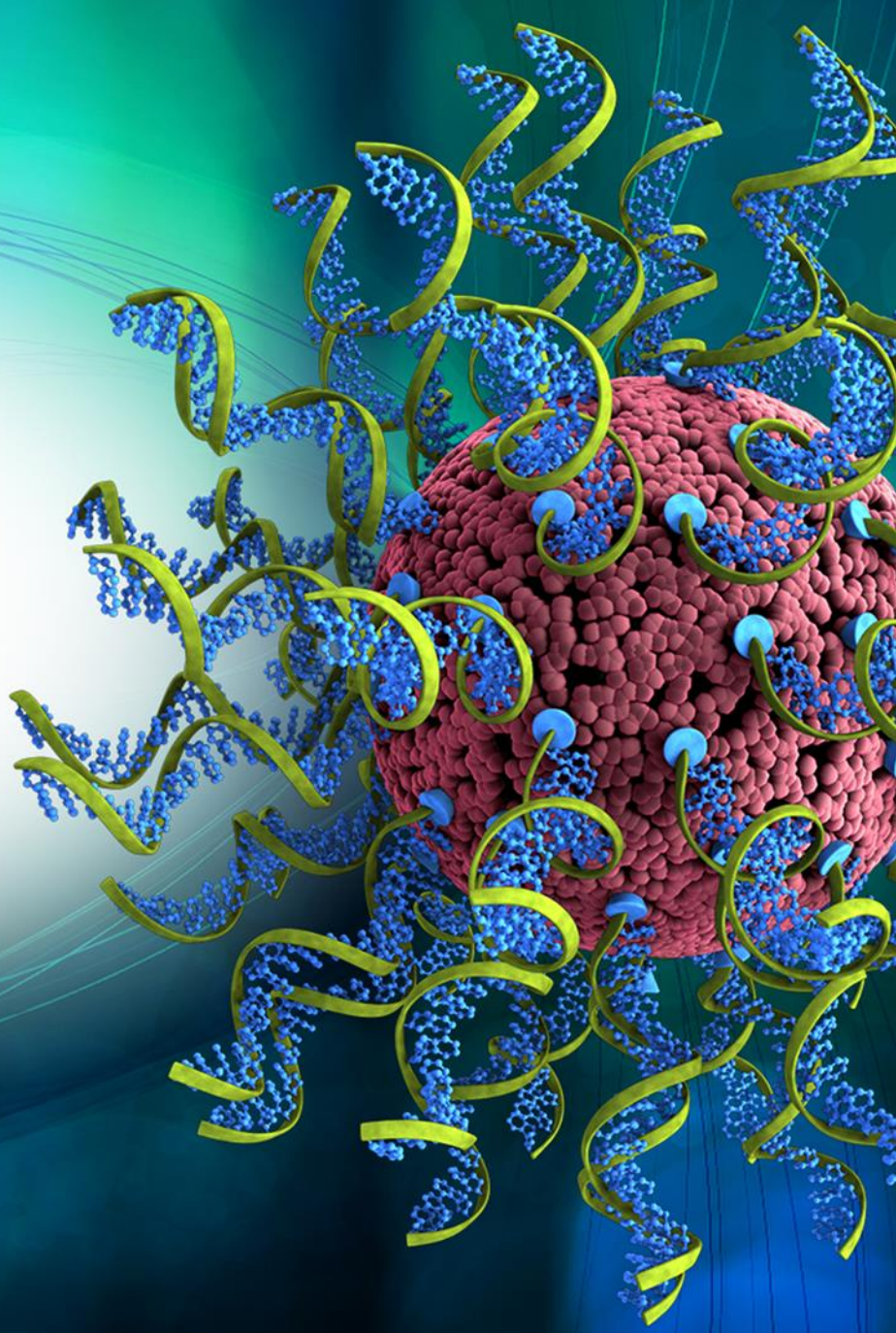
NEUROLOGY



Friedreich's Ataxia: A progressive neurodegenerative disorder that begins in childhood

- **Rare, life-shortening, debilitating autosomal recessive neuromuscular disorder**
- **Estimated 5,000 patients in the US and 15,000 patients worldwide**
- **Currently no approved therapies**
- **Driven by expansion of GAA triplet in the first intron of frataxin (FXN) gene**
  - Expanded repeat forms intramolecular triple-helix, which impairs transcription and reduces levels of frataxin
  - After childhood diagnosis, patients become wheelchair-bound in ~10 years and survive into mid-30s
- **Exicure strategy: use genetically targeted SNA therapy to remove FXN transcription blockage and increase FXN levels**

FARA Friedreich's Ataxia Research Alliance

Extensive preclinical data provide proof-of-concept for the SNA platform's potential applicability in neurological disorders

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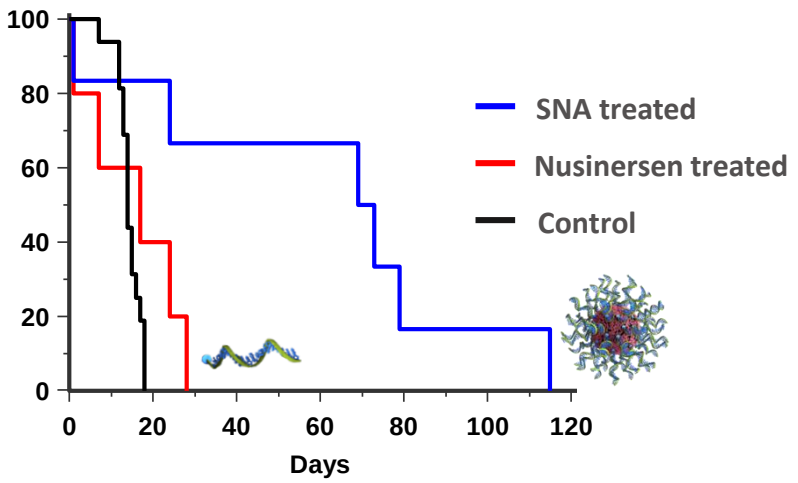
NEUROLOGY

ATAXIAS, BATTEN DISEASE, ALS, HUNTINGTON'S DISEASE

- **Nusinersen is a commercially available linear oligo therapeutic to treat spinal muscular atrophy (SMA)**
- **In a proof-of-concept nonclinical study, the SNA construct of the drug performed better than nusinersen**
- **Compared to nusinersen, the SNA construct:**
  - Doubled the levels of healthy full-length SMN2 mRNA and protein in SMA patient fibroblasts
  - Prolonged survival by 4x (maximum survival of 115 days vs 28 days for nusinersen-treated mice)
    - Mitigated the toxicity of nusinersen in mouse model
  - Showed higher persistence in CNS and lower clearance through kidney in rat biodistribution model

SNA treated survive 4X longer than nusinersen treated mice



Survival data presented at 2018 Annual Cure SMA Conference

SNAs show higher persistence and lower clearance

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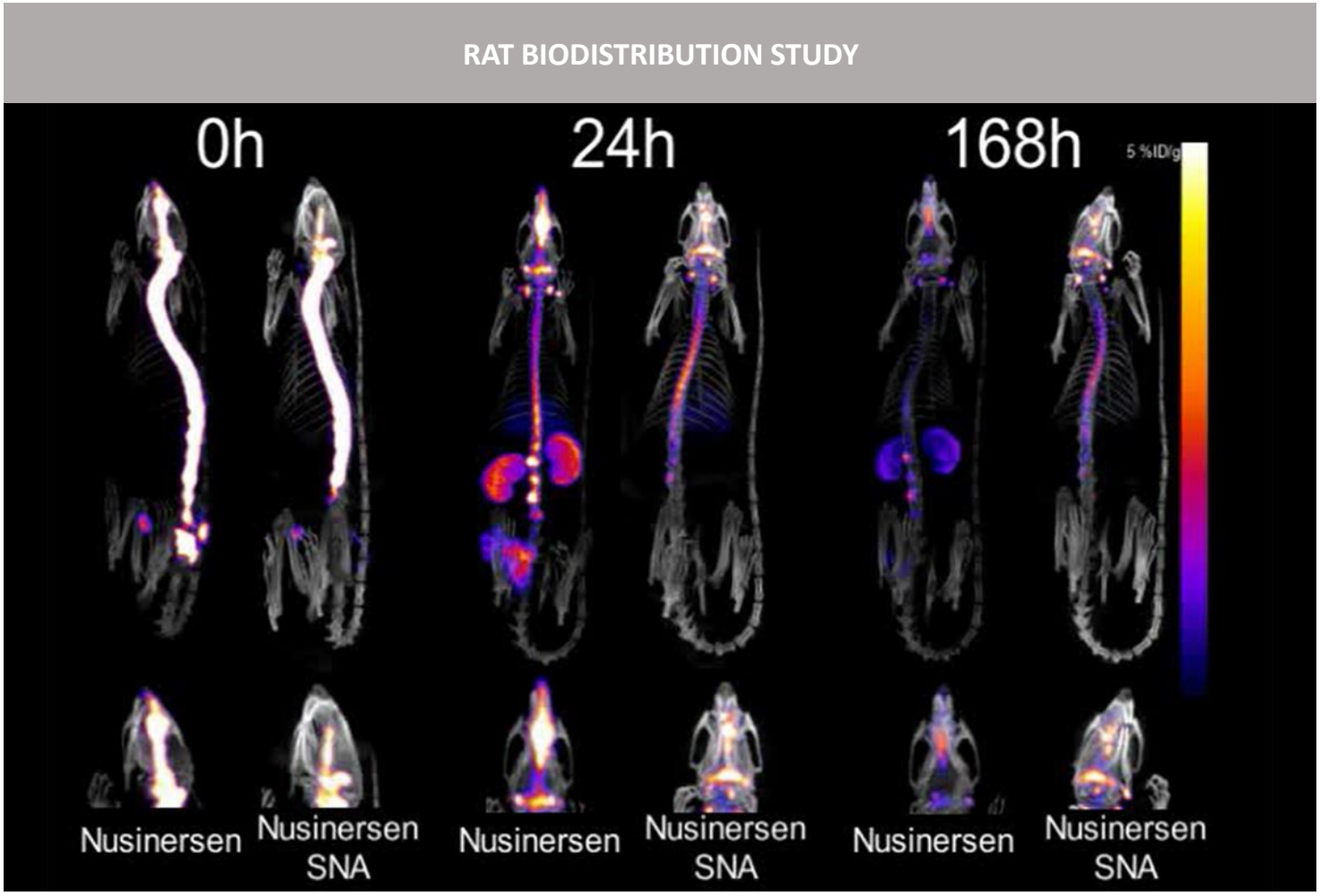
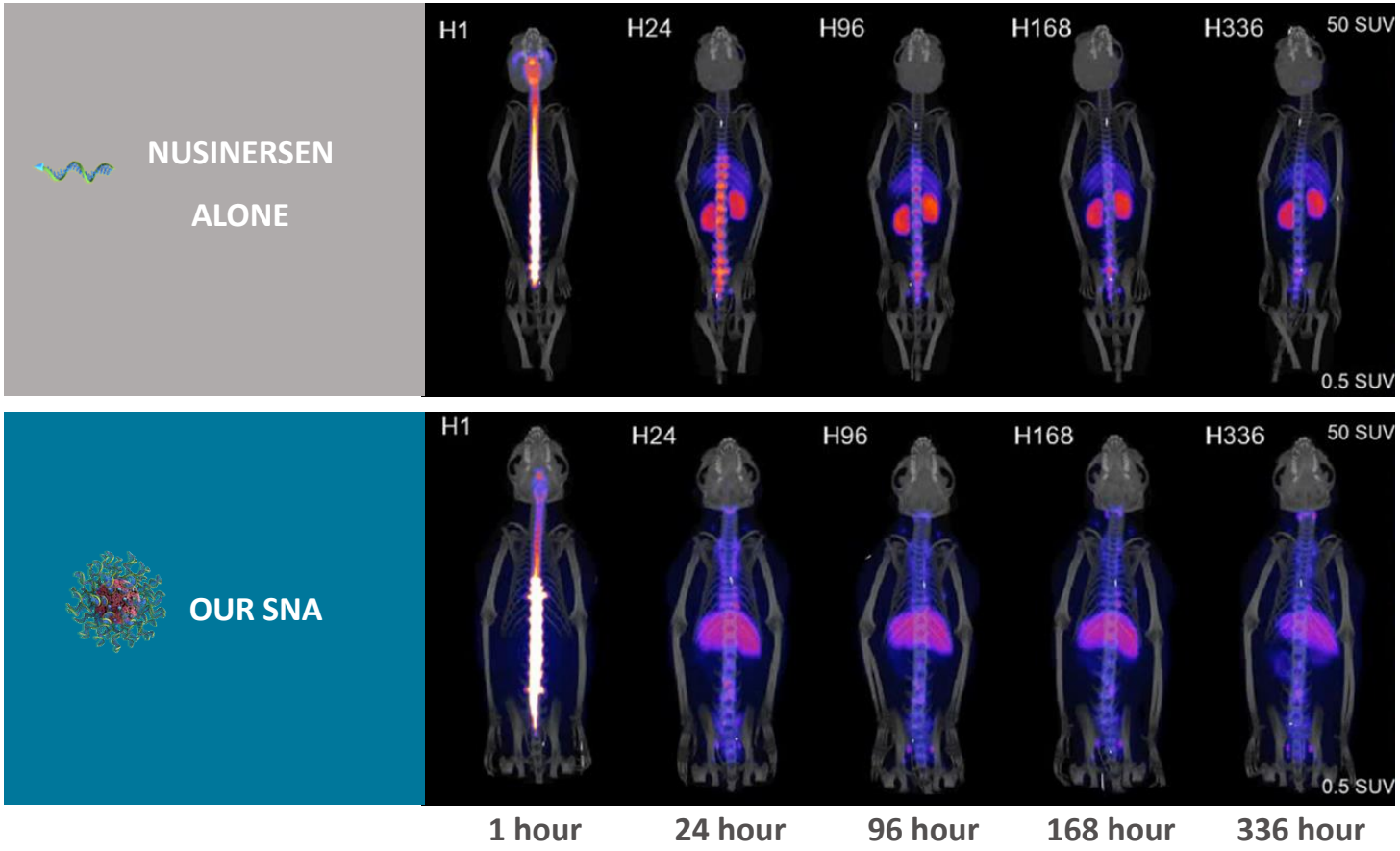
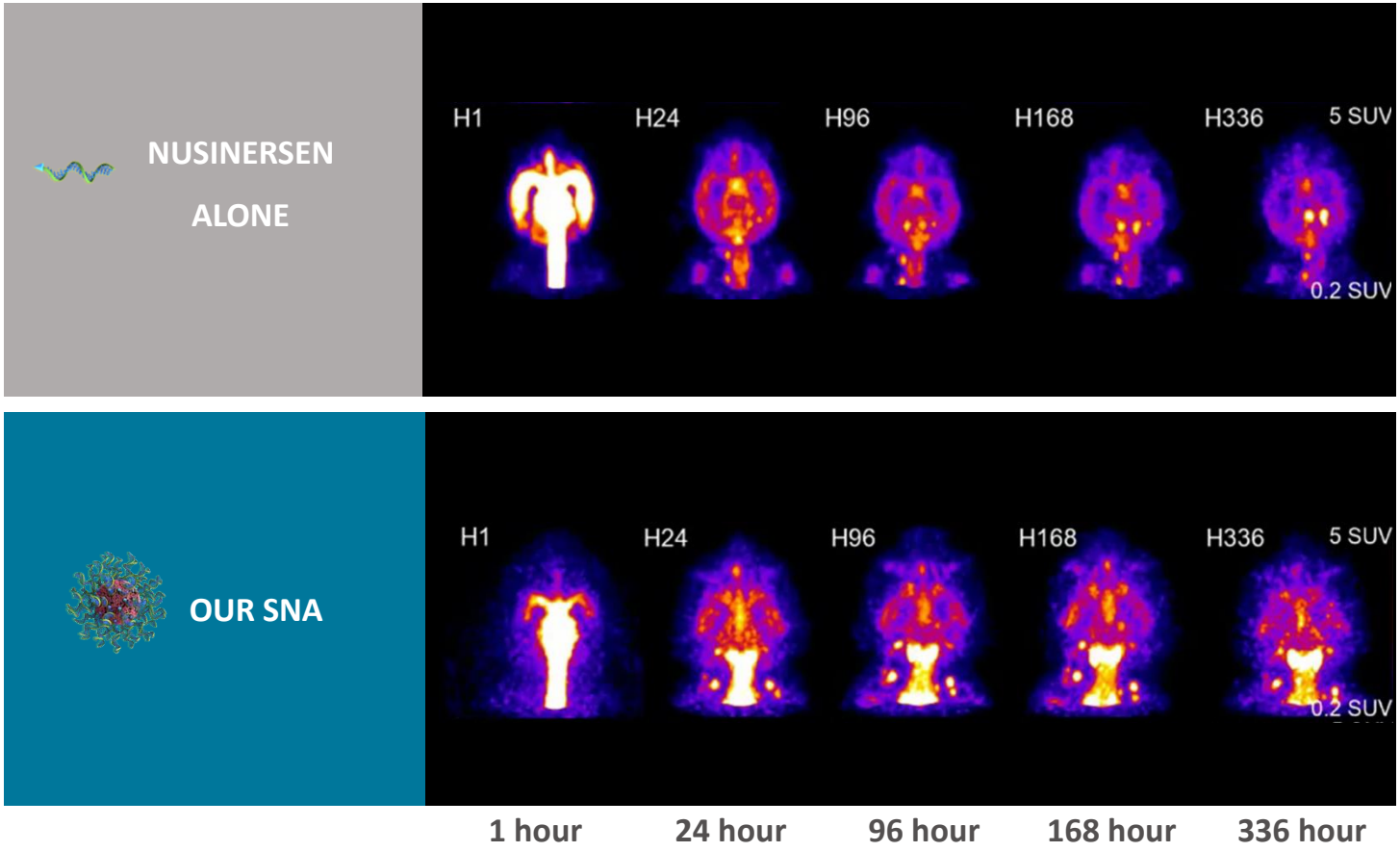


NHP biodistribution data show SNA penetration to all brain regions



SNAs distribute widely throughout the brain of non-human primates



Significant unmet medical need in rare neurological disorders

- **Diseases with genetically validated targets known, but few disease modifying therapies exist**
- **Not readily addressable by traditional therapeutic modalities**
- **Significant unmet medical need in rare neurological disorders:**
  - Spinocerebellar ataxia, Friedreich's ataxia, Batten disease, Ataxia telangiectasia, Angelman syndrome, Huntington's, ALS

Successfully administered SNAs to the CNS in animal models through intrathecal injections

EXICURE OPPORTUNITY

Higher potency and longer persistence in animal models suggest potential advantages for frequency of dosing and therapeutic activity in neurological disorders

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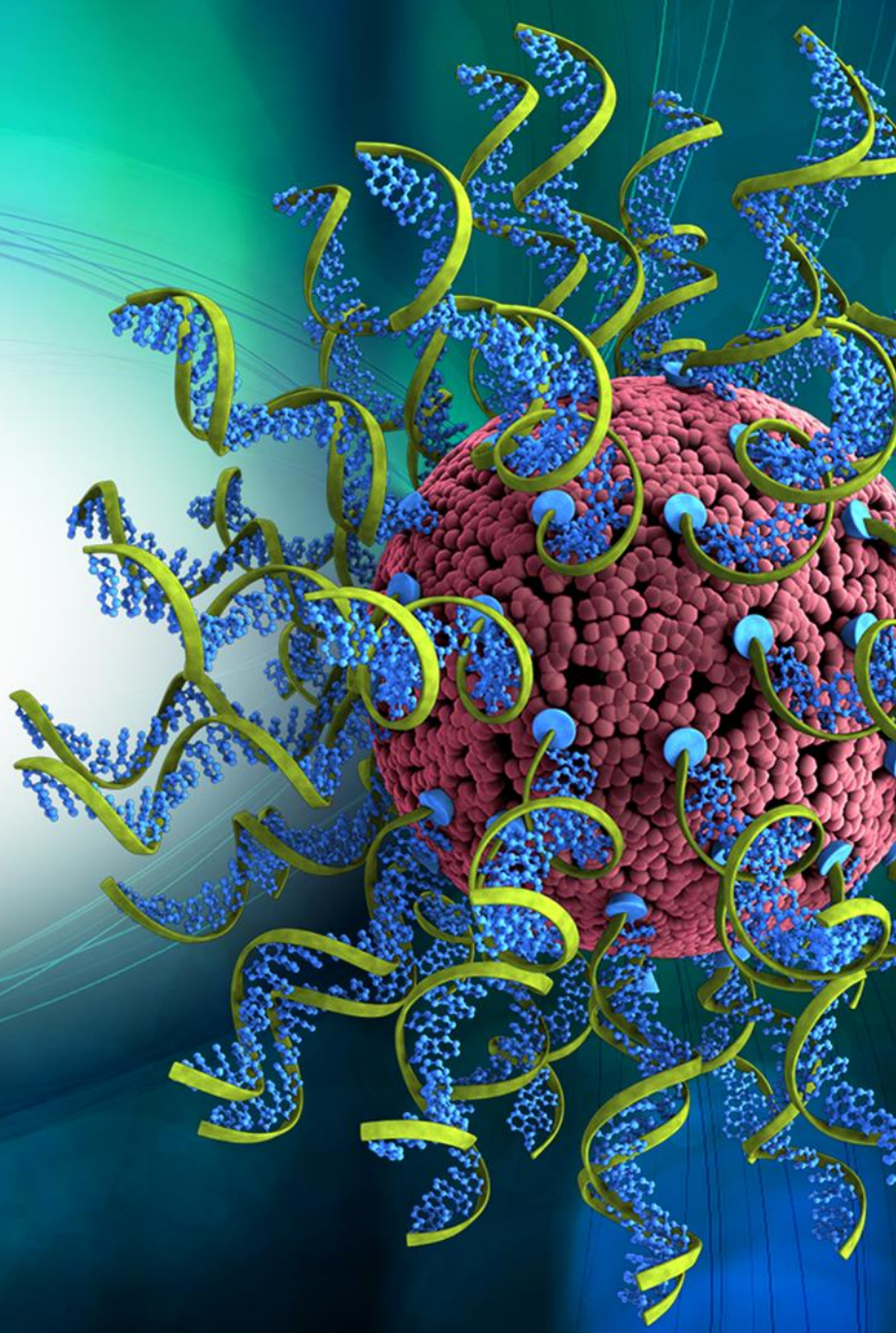
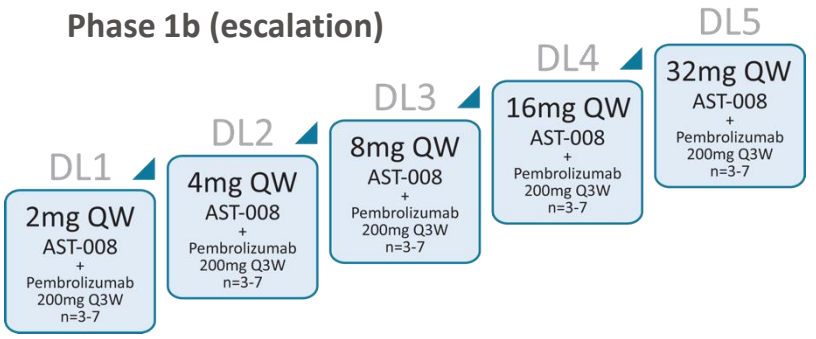
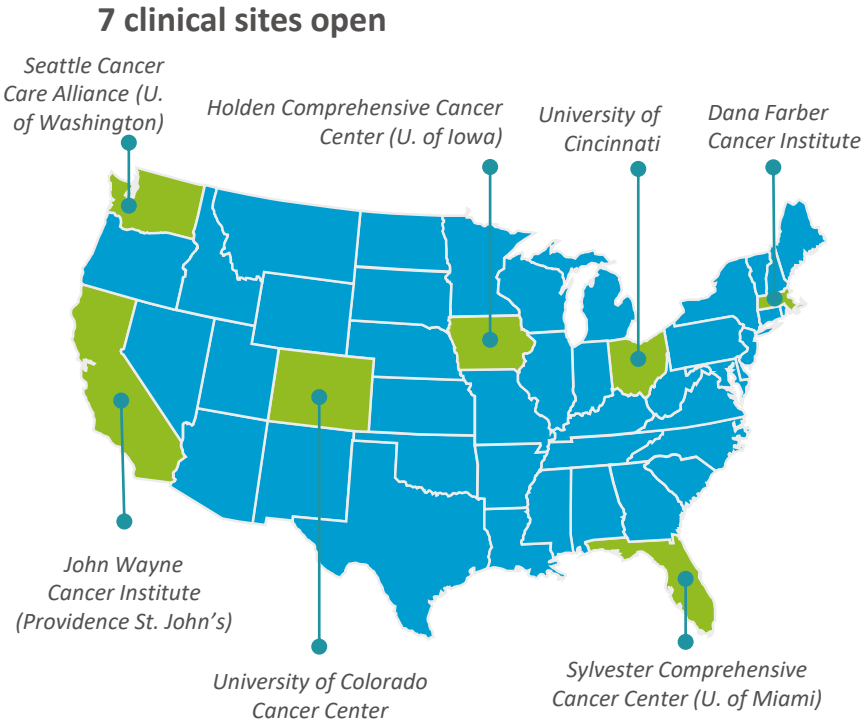
IMMUNO-ONCOLOGY



AST-008 in Phase 1b/2 trial in combo with Pembrolizumab

- **Phase 1b dose-finding stage: Open label, intratumoral administration of AST-008**
  - Enrollment completion expected in Q1-2020
  - Prioritized cancers: Merkel cell carcinoma, cutaneous squamous cell carcinoma, melanoma, head & neck squamous cell carcinoma
  - Checkpoint inhibitor naïve or refractory patients
  - Identifying recommended Phase 2 dose, and evaluating safety, PK, PD and efficacy
- **Phase 2 expansion stage in Q2-2020**
  - Planning to enroll Merkel cell carcinoma patients who have failed anti-PD-(L)1 therapy
  - Two-stage Phase 2 enrolling up to 29 patients
  - Safety, PK, PD, and efficacy read outs
  - Considering adding additional cohorts to the trial in other cancers
  - Up to 15 total sites expected in the US





Preliminary phase 1b/2 data suggest encouraging anti-cancer activity in Merkel cell carcinoma

- **14 Patients enrolled and treated with AST-008**
  - Five melanoma patients, four Merkel cell carcinoma ("MCC") patients, two cutaneous squamous cell carcinoma patients, two head and neck squamous cell carcinoma patients, and one mucosal melanoma patient
  - No treatment-related serious adverse events or dose-limiting toxicities have been observed
- **Fifth and final dose escalation cohort of phase 1b is open and enrolling**
- **Available data from the study show:**
  - AST-008 administration, alone or in combination with pembrolizumab, produced cytokine and chemokine expression and immune cell activation in patient blood indicative of desired immune activation.
  - Of the 4 MCC patients, one patient, who had previously progressed on anti-PD-1 antibody therapy, has confirmed stable disease with decreased target lesion diameters for a period in excess of 12 weeks, while a second MCC patient experienced a target lesion complete response and a confirmed overall partial response longer than 24 weeks.
  - Nine patients had progressive disease, two patients have not yet been evaluated and one is not evaluable.

All data as of December 11, 2019

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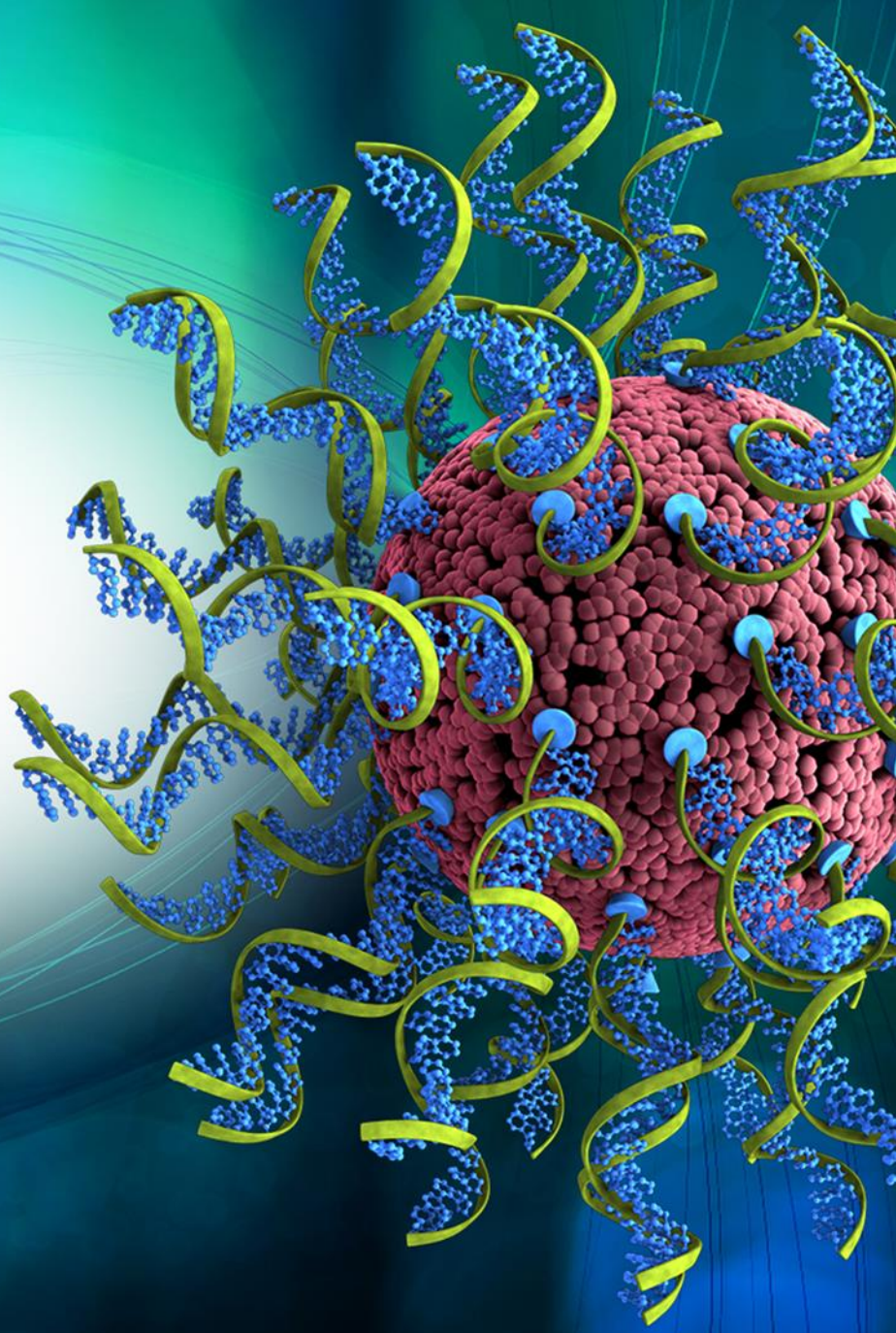
PARTNERSHIPS



SNA technology has broad partnership potential

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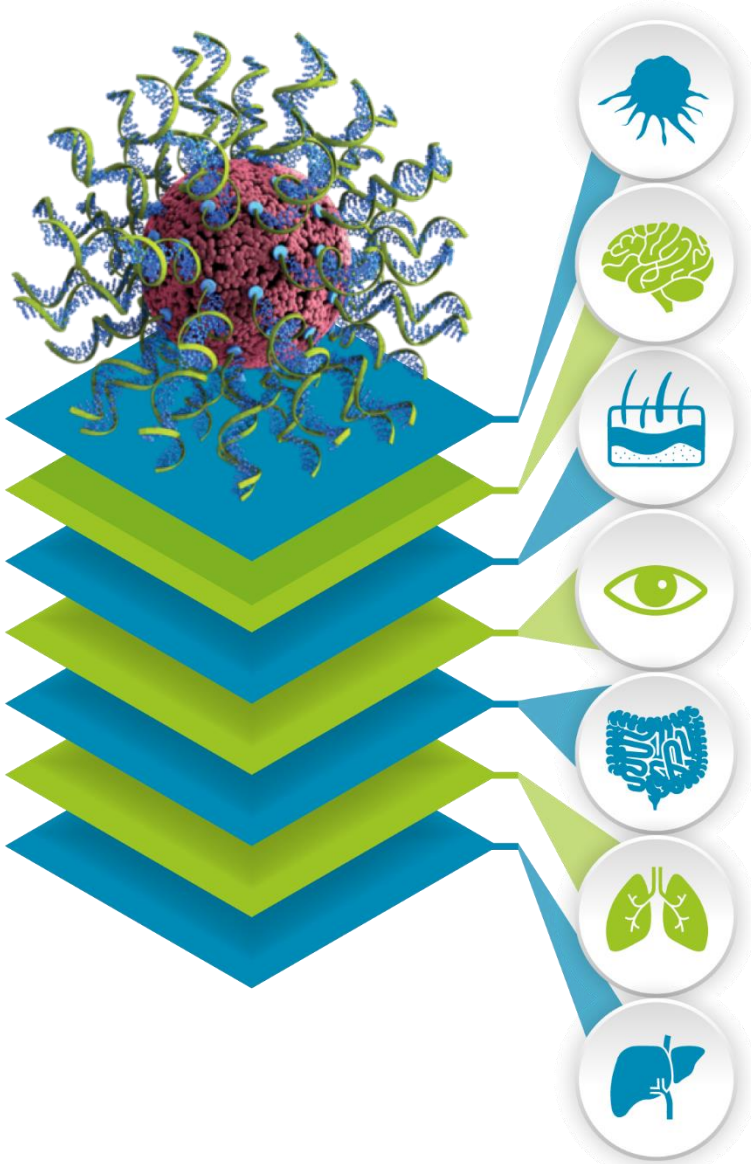

IMMUNO-ONCOLOGY AST-008 in Phase 1b/2 clinical development for solid tumors

NEUROLOGY NHP biodistribution study showed SNA accumulation and persistence in brain

DERMATOLOGY Partnerships with Allergan and Dermelix

OPHTHALMOLOGY Enhanced distribution and persistence in retinal layers compared to linear oligonucleotides after intravitreal injection in rabbits

GASTROENTEROLOGY Demonstrated activity through oral gavage in IBD mouse models

PULMONOLOGY Demonstrated target engagement and activity in mice with nebulized SNA formulation

HEPATOLOGY Up to 10-fold higher functional delivery after subcutaneous administration

Exicure + Allergan: a hair loss disorders collaboration

- **November 2019, initiated a partnership with Allergan to discover and develop two SNA-based treatments for hair loss disorders**
  - Exicure responsible for discovery and other costs prior to option exercise by Allergan
  - Allergan responsible for all costs after option exercise
- **Up to $725MM in development, regulatory and sales milestones**
  - $25MM upfront payment
  - $10MM payment to option a program or request Exicure to perform IND-enabling studies
  - Additional $15MM option payment if Exicure performs IND-enabling studies
  - Development and regulatory milestones of up to $97.5 million per program
  - Commercial milestones of up to $265 million per program
  - Tiered royalties of mid single-digit to mid-teen percentage

Exicure + Dermelix: a rare genetic skin disease collaboration

- **In February 2019, initiated a partnership with Dermelix targeting Netherton syndrome and up to 5 additional rare skin indications**
  - Dermelix responsible for clinical development
- **Up to $166M in development, regulatory and sales milestones per indication**
  - $1M upfront
  - Additional $1M for each option exercised (up to 5)
  - All development funded by Dermelix
  - Low double-digit royalties on annual net sales

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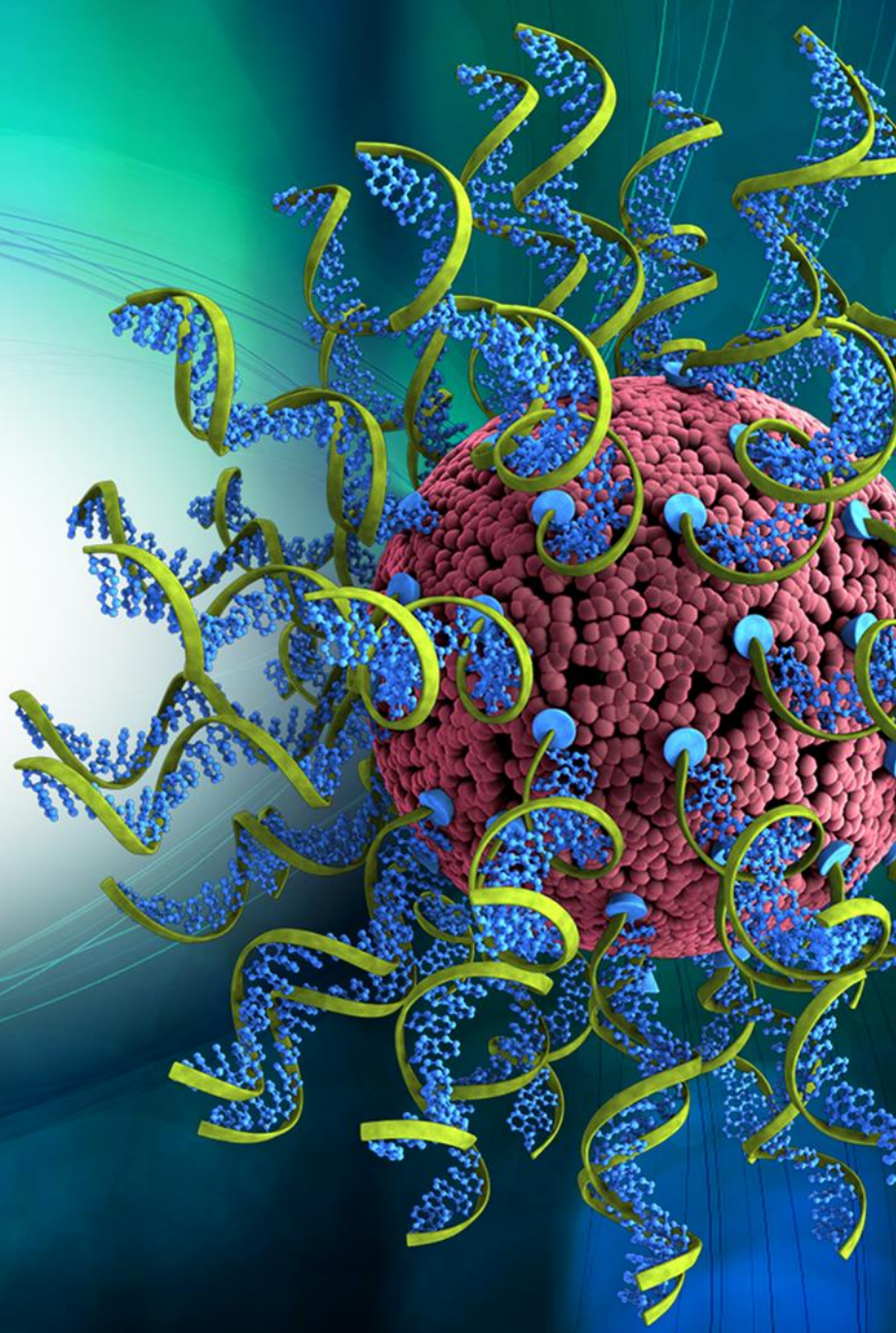
OPHTHALMOLOGY



Successful application of SNA technology in preclinical CNS models expected to translate into the eye

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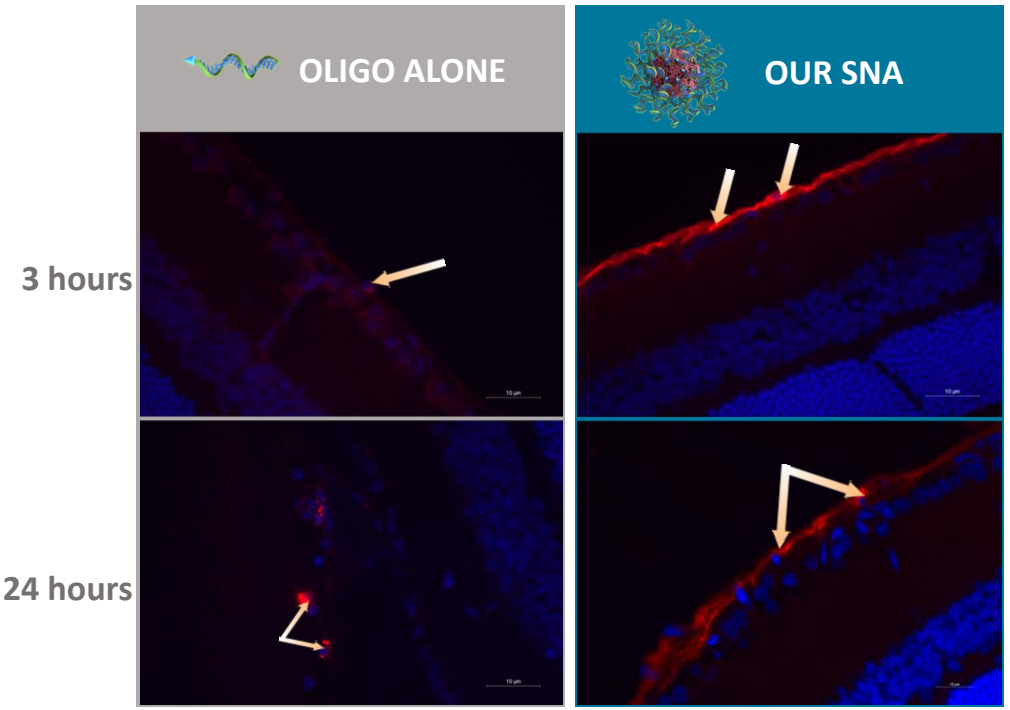
- **We believe the eye is an attractive organ for locally-applied SNAs**
  - Small & immune-privileged (<0.1% total body weight)
  - Established and non-invasive clinical assessments
  - Contralateral control eye for effective trial design
- **SNAs may possess potential advantages over gene therapy in the eye**
  - Intravitreal injections are safer and easier than subretinal injections
  - Tunable and reversible control of target expression
  - Ability to treat toxic gain-of-function diseases and target large genes
- **Approximately 250 rare diseases with known genetic targets**
  - CLN3 for Batten disease
  - BEST1 for vitelliform macular dystrophy
  - USH2A for Usher syndrome type 2A

Preclinical data provide rationale for expansion into ophthalmological genetic disorders

OPHTHALMOLOGY
undisclosed targets

undisclosed indication

- **SNA technology has shown an encouraging biodistribution profile in preclinical ophthalmology studies:**
  - Distributes to both posterior (retinal) and anterior (cornea) ocular structures
  - Exhibits higher distribution and persists longer compared to linear oligonucleotide
  - Does not cause inflammation in the eye



- **Intravitreal injection of fluorescent-labeled SNA or linear oligo *(in rats)***
- **Tissue harvested 3 hours following intravitreal injection**
- **Arrows indicate ganglion cell layer in the retinal surface**

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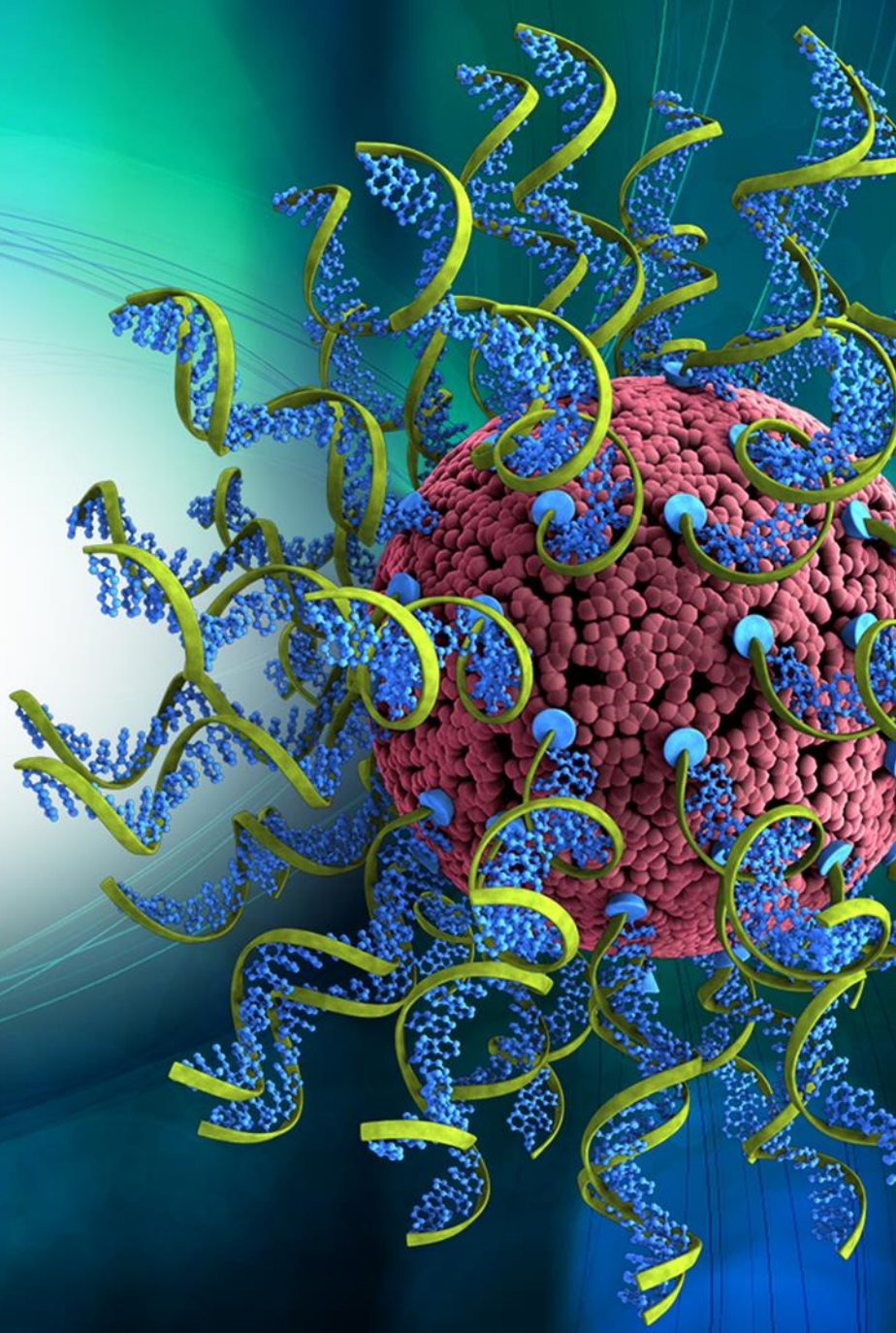
BUSINESS

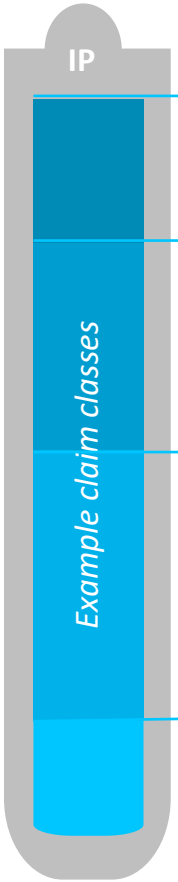


Extensive IP Portfolio

Exclusive, WW license to make, use and sell SNAs for therapeutic applications

IP portfolio includes 85+ issued or allowed patents and 125+ pending applications across multiple nucleic acid modalities

Multiple layers of protection exist extending platform coverage beyond 2030



METHOD OF USE
- Administration of oligonucleotide functionalized nanoparticles to skin

MECHANISM OF ACTION
- Antisense inhibition by oligos bound to inorganic nanoparticles
- Immuno-modulatory SNAs

COMPOSITION OF MATTER
- Methods of modulating nanoparticle uptake via oligo surface density
- SNAs comprising cross-linked oligonucleotides
- siRNA modified nanoparticles
- Multiplexing SNA for targeting two+ genes

DRUG SPECIFIC
- AST-008; XCUR17; TNF antisense sequences and chemistries

Management Team

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CEO

David Giljohann, PhD

CFO

David Snyder, MBA

COO

Matthias Schroff, PhD

BOD

Chad Mirkin, PhD
Co-founder

David Walt, PhD

Helen Kim, MBA

Jay Venkatesan, MD, MBA

Timothy Walbert

Jeffery Cleland, PhD

Bali Muralidhar, BM BCh, PhD

Bosun Hau

illumina · Northwestern University · CHIRON · VAXIMM · AuraSense · NimbleGen · Kite Pharma · Harvard University · Cellular Dynamics International · MOLOGEN AG · Quanterix · Northwestern University Feinberg School of Medicine · Brookside Capital · Orpheris · Horizon Pharma · Alpine Biosciences · Versartis

Recent achievements and upcoming milestones

- **2019 Achievements**
  - Friedreich's ataxia established as the first neurological indication
  - AST-008 Phase 1b preliminary results in patients with solid tumor
  - Allergan partnership in hair loss disorders; $25 MM upfront payment
  - Raised approximately $90.8 MM in gross proceeds from the sale of common stock
  - Up-listed to the NASDAQ Global Market
  - Expanded board of directors and scientific advisory board
- **2020 Milestones**
  - *Q2:* Expect to launch AST-008 Phase 2 trial in Merkel cell carcinoma
  - *Q2:* Expect to launch AST-008 Phase 2 trial in cutaneous squamous cell carcinoma
  - *Late 2020:* Expect to launch IND enabling studies for XCUR-FXN in Friedreich's ataxia
  - Advance Allergan collaboration in hair loss disorders
  - Advance Dermelix collaboration in Netherton syndrome
  - Continue active business development initiatives

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