BIONEER

Investor Presentation

June 2022

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Introduction

About Us

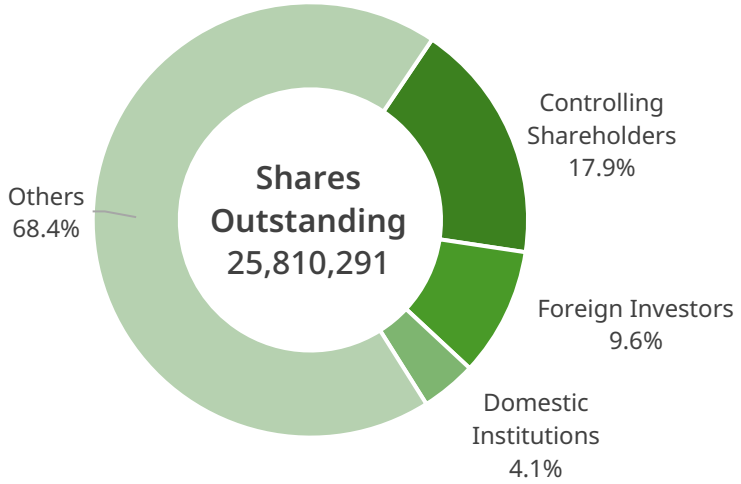
Bioneer Corporation

CEO/Chairman	Han-oh, Park
Established	August 28th, 1992
Employees	639 (As of Dec. 2021)
BIONEER Global Family	**HQ** Daejeon, South Korea **Bioneer Inc.** CA, USA **Bioneer Shanghai** Shanghai, China

Business Area

- **BIONEER** (Innovation • Value • Discovery) — Molecular Diagnostics
- **AceBiome** (A Probiotic Company of BIONEER) — Fat-loss Probiotics
- **siRNAgen THERAPEUTICS** — RNAi Therapeutics
- **Cosmeceuticals** — Hair-loss Treatment *CosmeRNA*
- **Nano-Bio** — Nano Beads, CNT composite, Nanowires

Shareholder Structure (as of Jun. 30, 2022)



Competitive Edge

- Total-Solution provider on the disease prevention-diagnosis-treatment with 30+ years experience in genetic technology
- Maximize profit margin based on the all-in-house manufacturing
- RNAi drug development backed up with strong cash cow business

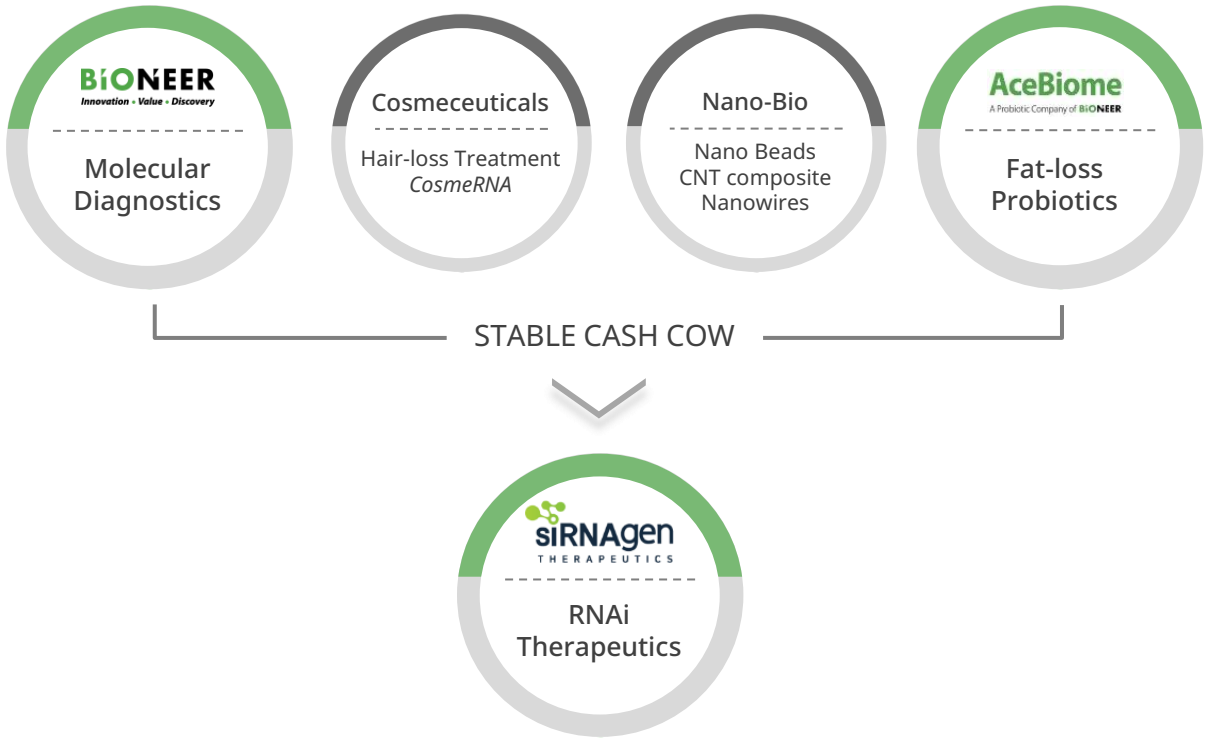
About Us

Business Model

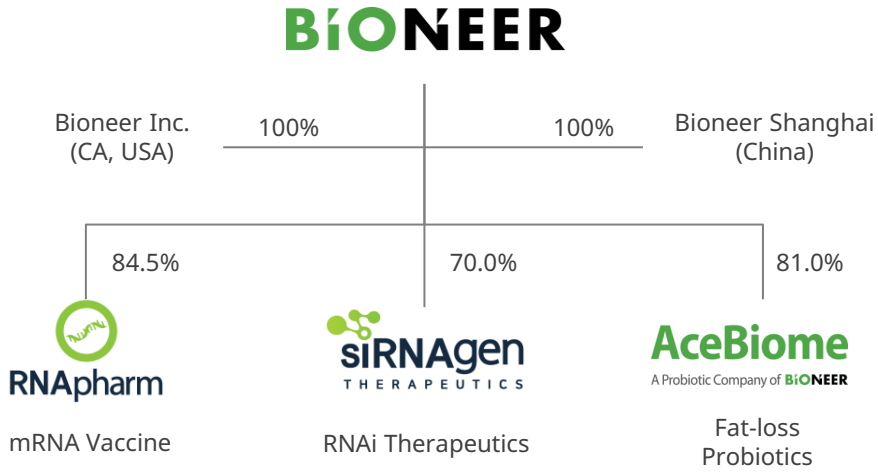
BIONEER
Innovation • Value • Discovery
Molecular Diagnostics and Life Sciences

AceBiome
A Probiotic Company of BIONEER
Fat-loss Probiotics

siRNAgen THERAPEUTICS
RNAi Therapeutics



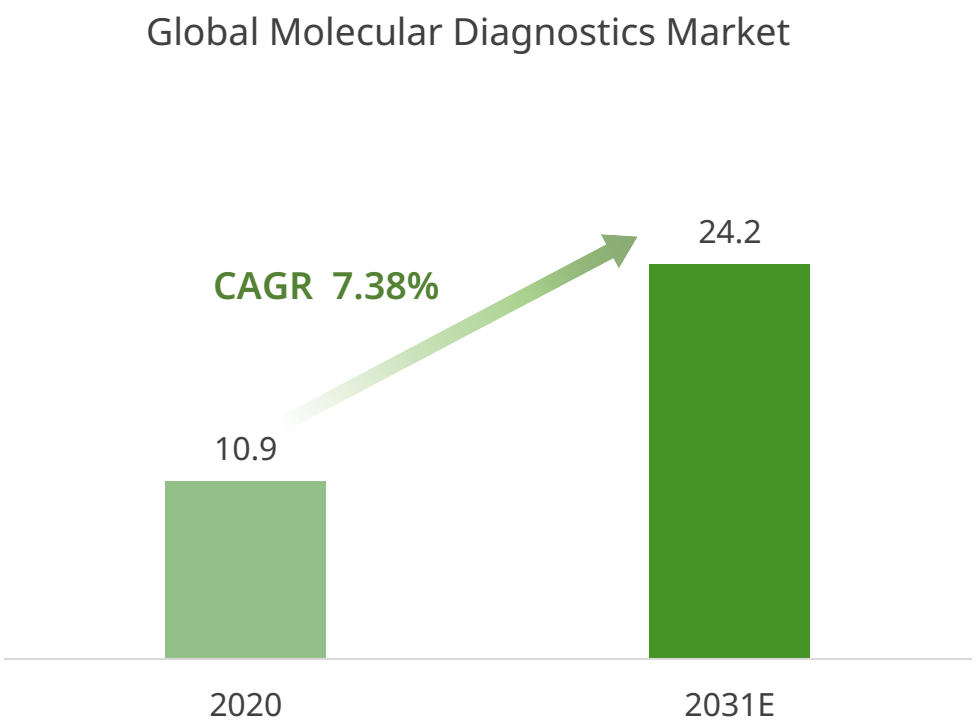
Corporate Governance



Business Divisions

Molecular Diagnostics (MDx)

Market Prospect



(Unit: USD Billion)

(Source: BIS. Molecular Diagnostics Market, 2021)

Growth Factors

Global Molecular Diagnostics Market is expected to reach **$24.2B** by 2031

Increasing demand and awareness on **POCT** (Point-of-Care Testing) diagnostic systems

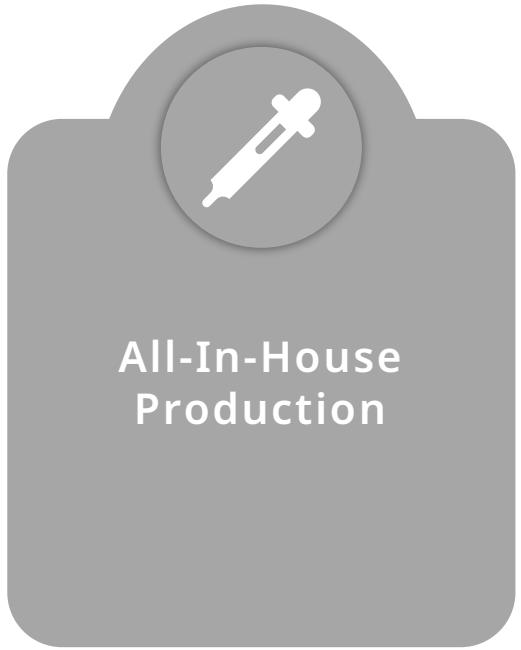
Escalating elder population, outbreak of varied viral/respiratory diseases, and other diseases in need of treatment

Molecular Diagnostics (MDx)

Unmet Needs

MDx Plant Expansion

- Increased production capacity
- Development of 4th Generation MDx instruments



Internalized Manufacturing

- From raw materials to MDx instruments
- Cost-advantage & Production efficiency

MDx Ecosystem

- Superior level of sensitivity and specificity
- Customized MDx solution enables to target wider range of customers

Molecular Diagnostics (MDx)

$160M investment planned to build fully automated production facility by 2025

Global Center

$70M investment to serve global market
4th Generation MDx instruments and nucleic acid extraction kits

* Production Line: ExiPrep™, AccuPrep®, Saliva, POCT(Exp.)

FIND
Diagnosis for all

Partnered with FIND :
POC MDx development project

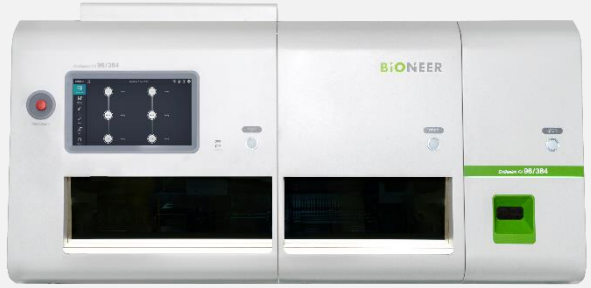
- Financial and procedural support throughout R&D-validation-production-sales of IRON-qPCR/kits in LMICs

*FIND: Foundation for Innovative New Diagnostics
(global non-profit organization for diagnostics)

4th Generation MDx System

IRON-qPCR™

- POCT (Point-of-Care-Testing) instrument
- 30 minutes from decapping to automated results
- Up to 2 samples/test, detecting max. 40 types of pathogens



ExiStation™ FA 96/384

- Fully automated MDx instrument
- No need for the biosafety-cabinet
- 100 minutes from decapping to automated results
- Up to 6-94 samples/test, max. 20 types of pathogens

Molecular Diagnostics (MDx)

All-In-House production secured sensitivity, specificity, and cost-advantage

All-In-House Production

Raw Materials | Synthetic DNA/RNA | PCR Kits | MDx Instruments

Competitiveness in Quality · Cost-efficiency · Capacity

DNA/RNA/Gene Synthesis
- Ton-scale phosphonamidite capacity
- 100+ kinds of raw materials production
- Production capacity: 30,000+ oligonucleotides per day

MDx Kits AccuPower® PreMix Technology
- High Sensitivity based on Pyro-HotStart™ and Dual-HotStart™ technology

MDx Instruments
- Developed and commercialized MDx total solution

BIONEER MDx Ecosystem

MDx Kits | **MDx Instruments** (DNA/RNA Purification/Amplification)

Provides MDx Total Solution
- Nucleic Acid Extraction and PCR kits optimized to instrument
- Outstanding stability through patented lyophilized PreMix
- 40+ diagnostic kits portfolio, including SARS-CoV-2

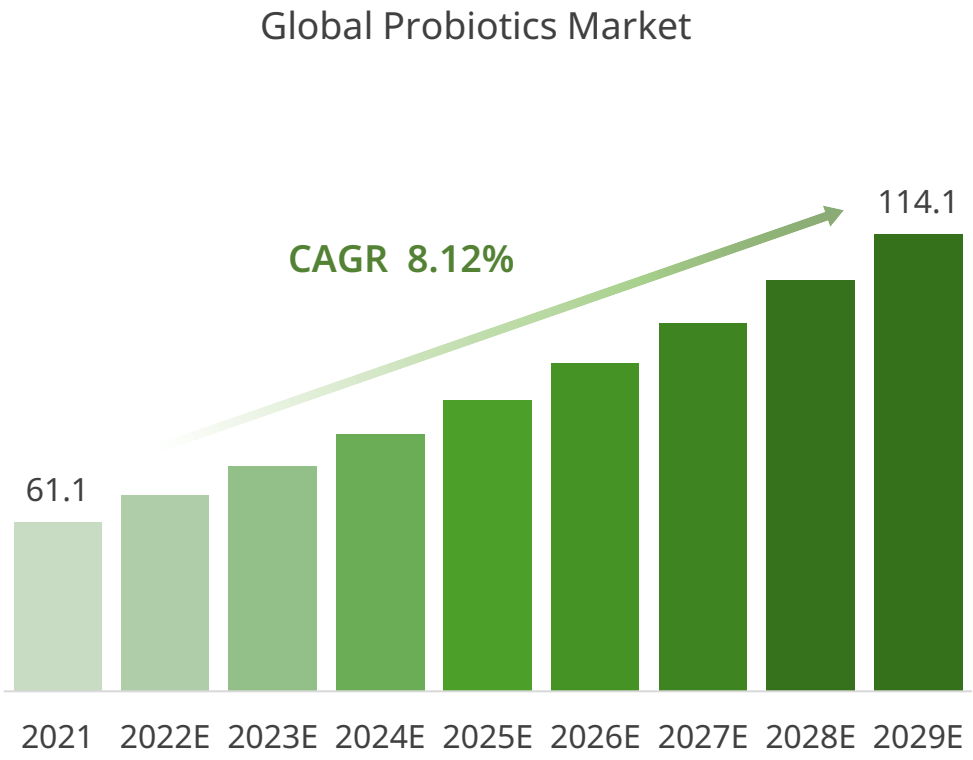
*RT-PCR workflow = Nucleic Acid Extraction + Amplification

Nucleic Acid Extraction/Purification	PCR PreMix	Amplification
• Extract DNA/RNA from the sample	• Prepare mix to be amplified	• Nucleic Acid Amplification

Probiotics

AceBiome
A Probiotic Company of BIONEER

Market Prospect



(Unit: USD Billion)
(Source: Data Bridge Market Research, 2022)

Growth Factors

Global market expected to reach **$114.1B** by 2029 with increasing interest in the wellness

AceBiome records **AAGR of 157%** (2019-21), aggressively expanding its market share

Highly scalable business from intestinal health, immune health, body fat reduction, and skincare

BIONEER

AceBiome
A Probiotic Company of BIONEER

Lactobacillus gasseri BNR17™ Highlights

Increasing interests in wellness

Demand in health supplementary

Unmet Need

First MFDS approved probiotic strain in body fat reduction

Body fat reduction, proliferation of probiotics and healthy, regular bowel movement

600+ research papers related to *Lactobacillus gasseri* BNR17™ published in SCIE-level international journals

Awarded **"Ingredient of the Year in Weight Management"** at NutraIngredients-USA Awards 2018

Patented in **10** countries including US, China, Japan, Korea, Chile, and various European countries

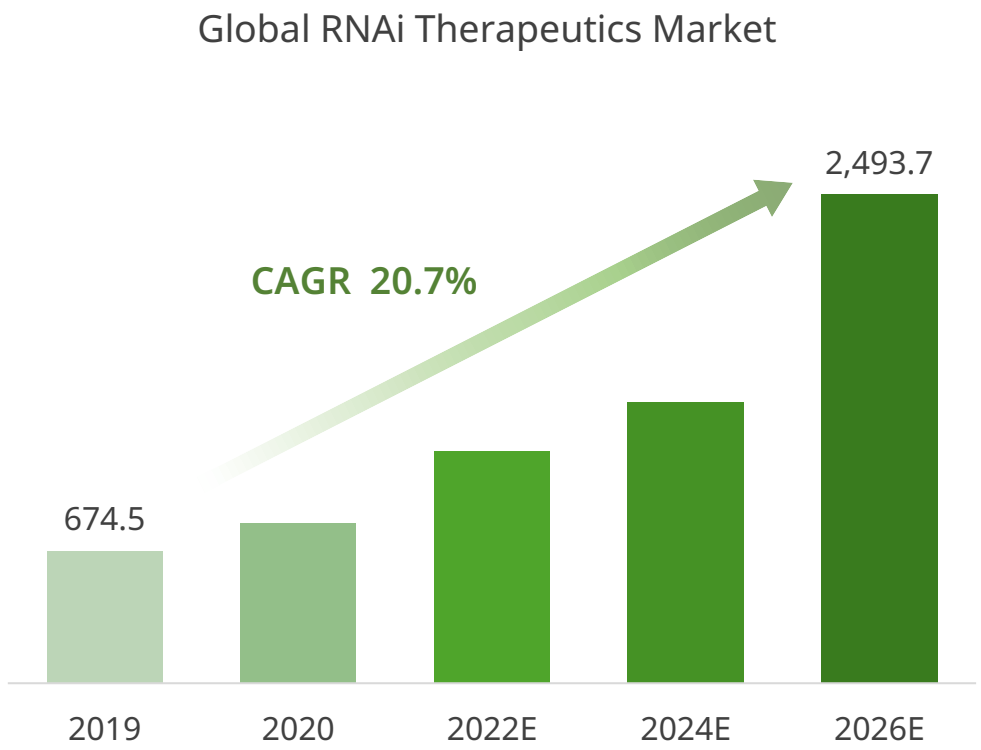
BNR Series

Diversified Product Portfolio (BNRThin & BNR)

BIONEER

RNAi Therapeutics

Market Prospect



(Unit: USD Million)

(Source: Facts and Factors Market Report, 2021)

Growth Factors

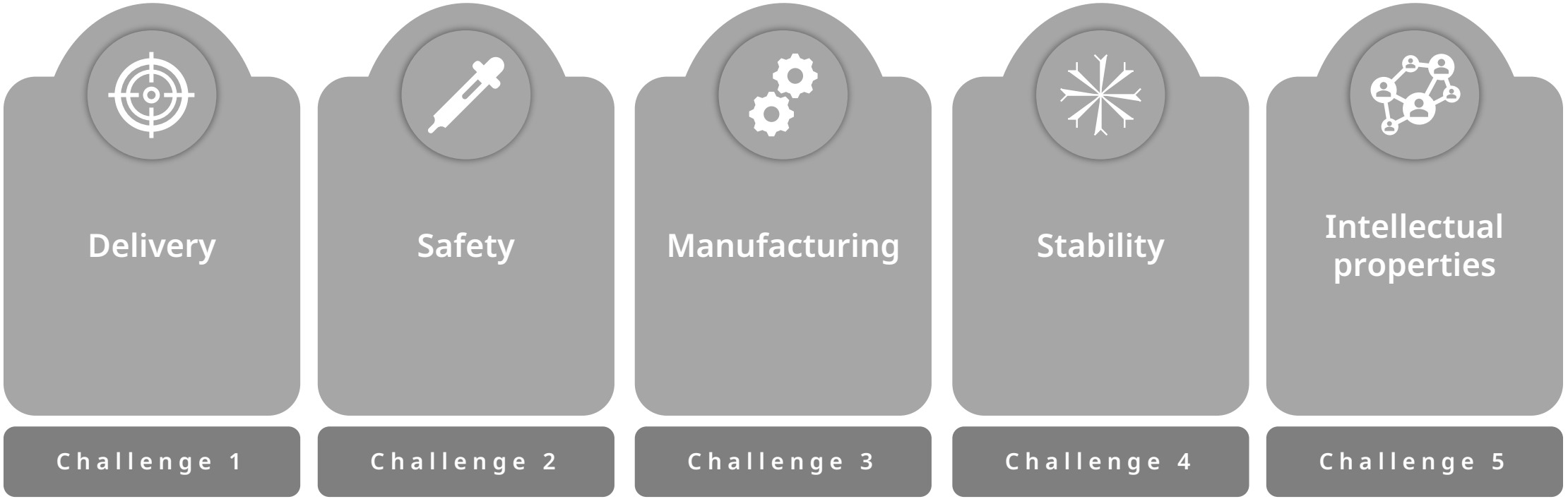
Global RNAi Therapeutics market is expected to be worth **$2,493.7M** by 2026

RNAi Therapeutics is responsible for **40%** of annual pipeline growth

CAGR of 20.7%, which is one of the fastest growth rate in all therapeutics

RNAi Therapeutics

RNAi Challenges



SAMiRNA™ Platform

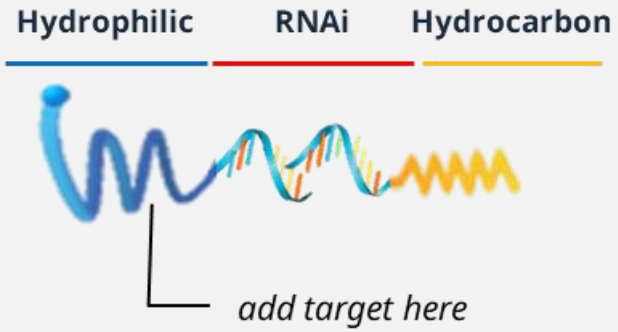
SAMiRNA™ (Self-Assembled-Micelle inhibitory RNA)

RNAi Challenges	SAMiRNA™	
Delivery beyond the liver	Extrahepatic delivery	Inflamed, adipogenic, neoplastic tissues in kidney, lung, skin, visceral fat, and brain via IV, ID, SC injection, and inhalation
Toxicity from innate immune stimulation	Demonstrated safety	Self-assembling single molecule design removes traditional toxicity problems of liposome-induced innate immune reaction
Challenging CMC & Manufacturing	Manufacturing ease	One-step automated solid-phase synthesis with no formulation or encapsulation step enable greener, easier manufacturing
Cold chain distribution	RT stability	Single molecule design prevents NP lysis at RT and humidity for 1-year, eliminating the need for cold chain distribution
International Protection	Strong IP portfolio	SAMiRNA™ platform is protected by 150+ patents approved and pending in major markets, (Platform FTO completed)

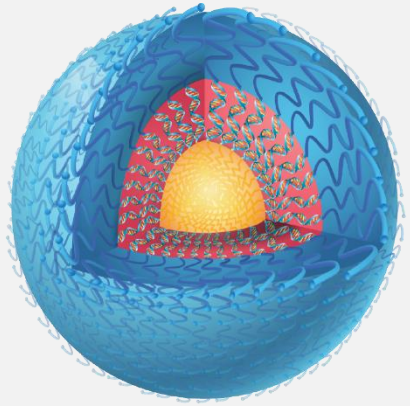
SAMiRNA™ (Self-Assembled-Micelle inhibitory RNA)

Combination of conjugation & NP encapsulation strategies
without any of their downsides for enhanced safety, bioavailability, stability, sustainability

Structure of SAMiRNA™ Platform



Conjugate



Nanoparticle

Varying the modular components can tune targetability & MoA for endosomal escape

*MoA : Mechanism of Action

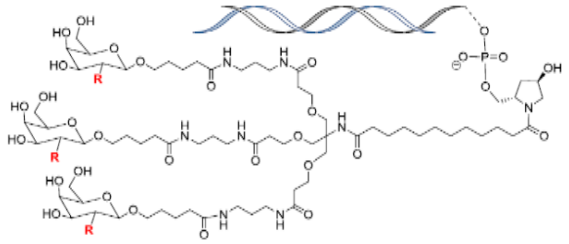
Delivery is made more effective by excellent PK resulting from the nanoparticle structure

Strong IP positioning (6 platform + 13 product patent families, 150+ total in key geography)

siRNA Challenges

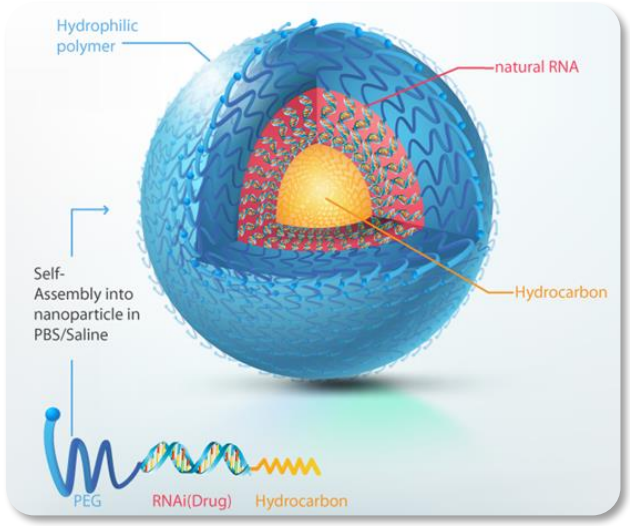
siRNA challenges are conjugation and encapsulation, which come with significant downsides

Naked (Conjugated) RNAi	SAMiRNA™	Nanoparticle Encapsulation

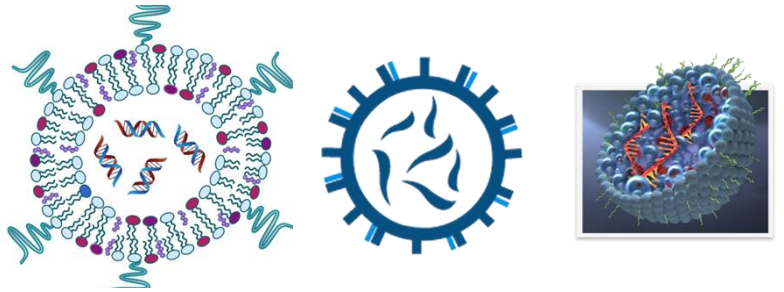


Alnylam PHARMACEUTICALS · arrowhead pharmaceuticals · Dicerna pharmaceuticals · SILENCE THERAPEUTICS

Poor bioavailability & PK,
delivery limited to liver



Self-Assembled-Micelle Inhibitory RNA

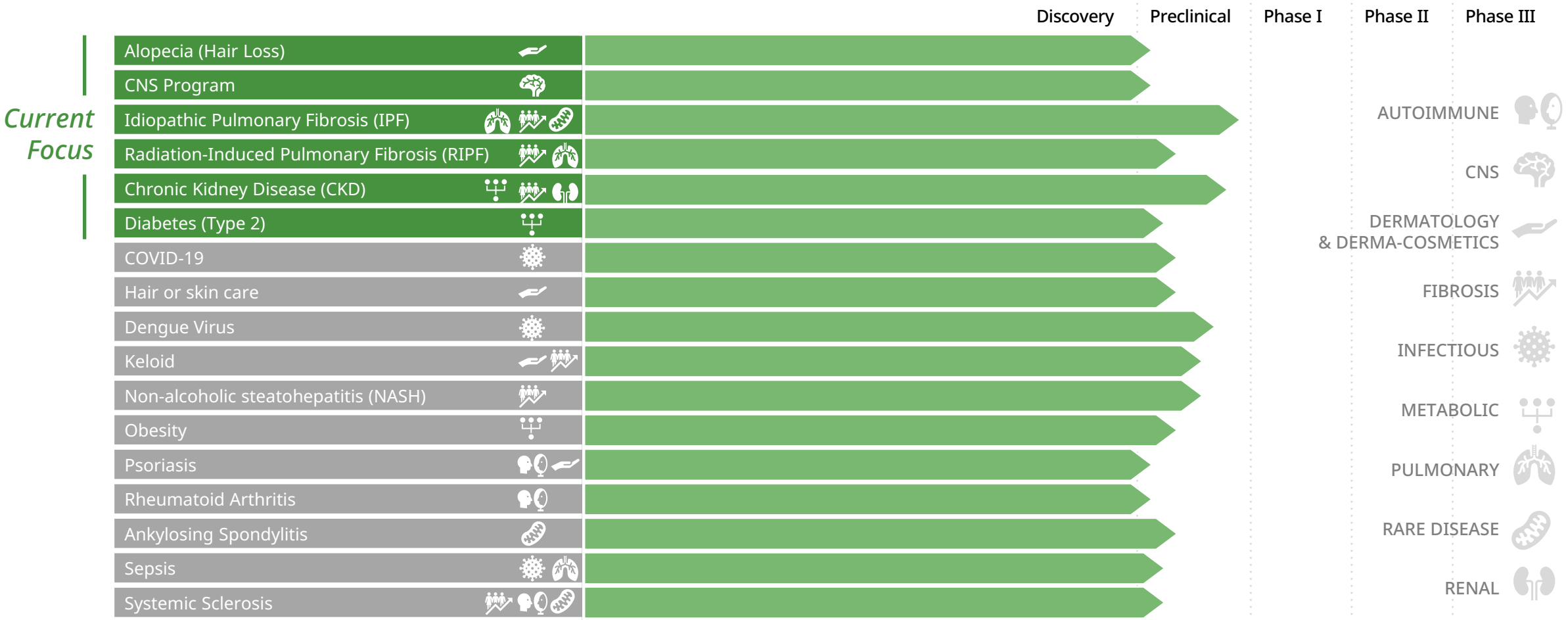


Alnylam PHARMACEUTICALS · ARUNABIO · ReCode THERAPEUTICS

Toxicity, difficulty manufacturing
& scaling, unstable

SAMiRNA™ Pipelines

17 Candidates, 18 Indications



Financial Highlights

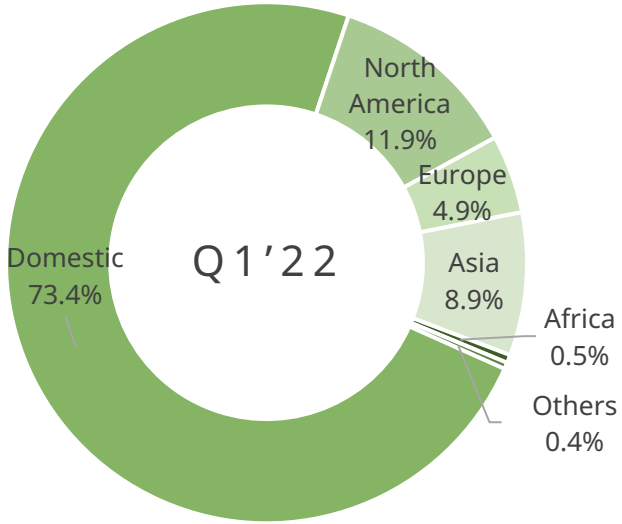
Q1 Earnings Summary

Revenue	KRW 615B	(YoY +23.2%, QoQ +10.2%)
Operating Income	KRW 104B	(YoY -42.7%, QoQ +30.4%)

[Consolidated | KRW Billion]	Q1 '22	Q4 '21	Q o Q	Q1 '21	Y o Y
Revenue	615	557	10.2%	499	23.2%
└ Bioneer Corp.	251	217	15.2%	325	-22.8%
└ AceBiome	364	340	7.0%	174	109.4%
└ Others	-	-	-	-	-
Gross Income	479	428	12.0%	375	27.7%
Gross Margin (%)	*78.0%*	*76.8%*	*1.2%p*	75.2%	2.8%p
SG&A Expenses	375	366	2.4%	194	93.8%
Operating Income	104	62	68.4%	181	-42.7%
Operating Margin (%)	*16.9%*	*11.1%*	*5.9%p*	*36.4%*	*-19.5%p*
└ Bioneer Corp.	69	20	238.9%	166	-58.6%
└ AceBiome	41	48	-14.7%	22	87.3%
└ Others	(5)	(6)	-13.7%	(6)	-13.4%

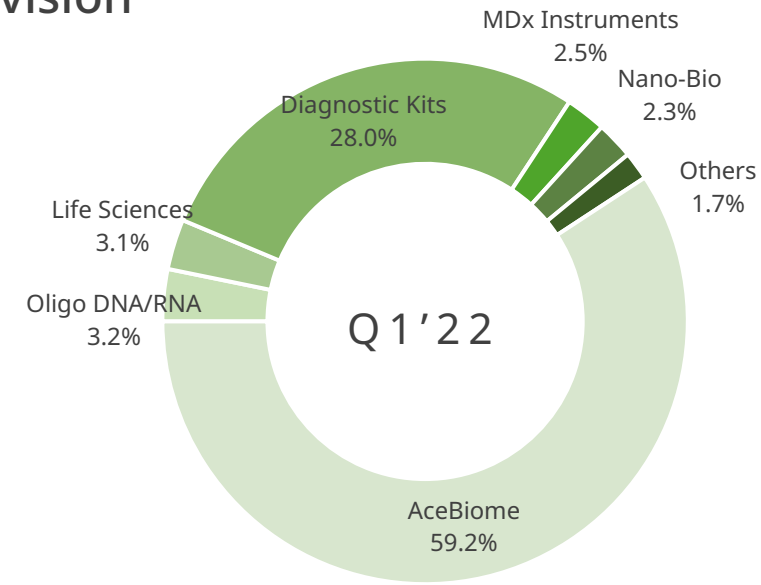
Q1 Revenue Breakdown (Consolidated)

By Region



Q1'22	(KRW Million)
Domestic	45,130
North America	7,321
Europe	2,993
Asia	5,460
Africa	310
Others	240
Total	**61,454**

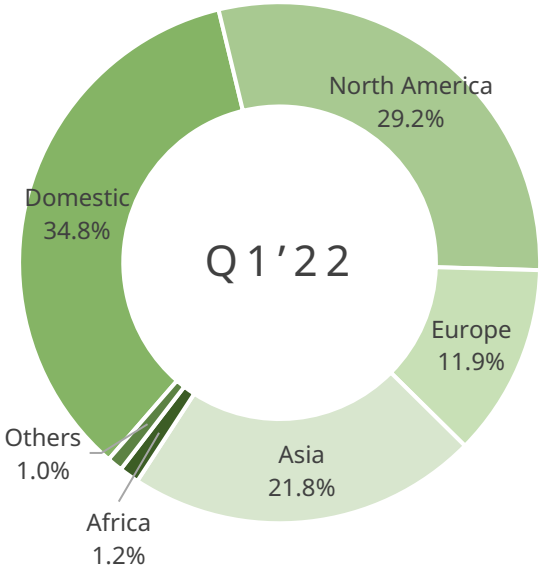
By Division



Q1'22	(KRW Million)
Diagnostic Kits	17,180
Life Sciences	1,901
Oligo DNA/RNA	1,971
MDx Instruments	1,528
Nano-Bio	1,412
AceBiome	36,395
Others	1,067
Total	**61,454**

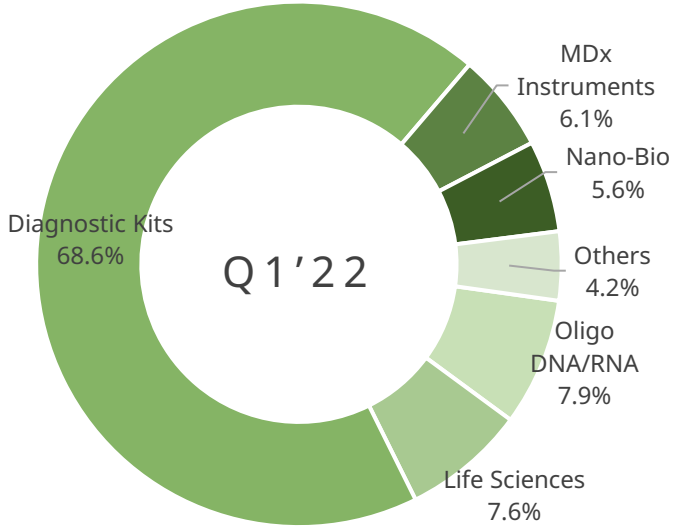
Q1 Revenue Breakdown (Non-Consolidated)

By Region



Q1'22	(KRW Million)
Domestic	8,730
North America	7,321
Europe	2,993
Asia	5,460
Africa	310
Others	240
Total	**25,054**

By Division



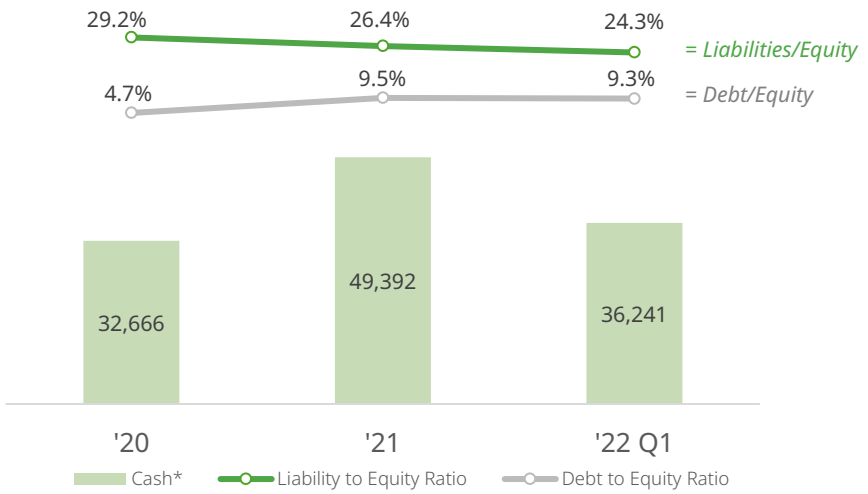
Q1'22	(KRW Million)
Diagnostic Kits	17,180
Life Sciences	1,901
Oligo DNA/RNA	1,971
MDx Instruments	1,528
Nano-Bio	1,412
Others	1,062
Total	**25,054**

Financial Summary

Financial Position (KRW Billion)

	Q1 '22	'21	'20
Assets	2,691	2,624	1,912
Current Assets	1,394	1,364	951
└ Cash & Cash Equivalents	362	494	327
Non-current Assets	1,297	1,260	961
└ Tangible Assets	1,173	1,135	830
Liabilities	526	548	432
Current Liabilities	479	508	351
Non-current Liabilities	47	40	81
Equity	2,165	2,076	1,480
Capital Stock	129	129	126
Capital Surplus	2,181	2,182	1,853
Retained Earnings	(195)	(281)	(523)

Net Cash & Financial Ratio (KRW Billion)



Cash Flow (KRW Billion)

	Q1 '22	Q4 '21	Q1 '21
Cash (Beginning of Period)	494	381	327
Cash Flow from Operating Activities	5	116	142
Cash Flow from Investing Activities	(137)	(0.6)	(204)
Cash Flow from Financing Activities	(2)	(7)	136
Cash (End of Period)	362	494	404

Income Statement

[Consolidated | KRW Million]	2021				SUM	Q1 '22	QoQ	Y o Y
	Q1	Q2	Q3	Q4				
Revenue	49,882	54,109	63,986	55,767	223,744	61,454	10.2%	23.2%
└ Bioneer Corp.	32,470	34,404	34,757	21,743	123,374	25,054	15.2%	-22.8%
└ AceBiome	17,382	20,810	28,119	34,024	100,335	36,395	7.0%	109.4%
└ Others	30	-	5	-	35	5	-	-83.3%
Gross Income	37,515	42,860	51,016	42,806	174,197	47,924	12.0%	27.7%
Gross Margin(%)	*75.2%*	*79.2%*	*79.7%*	*76.8%*	*77.9%*	*78.0%*	*1.2%p*	*2.8%p*
SG&A Expenses	19,367	20,216	50,917	36,633	127,133	37,525	2.4%	93.8%
Operating Income	18,148	22,644	98	6,174	47,064	10,399	68.4%	-42.7%
Operating Margin(%)	*36.4%*	*41.8%*	*0.2%*	*11.1%*	*21.0%*	*16.9%*	*5.9%p*	*-19.5%p*
└ Bioneer Corp.	16,596	15,159	(3,274)	2,027	30,508	6,869	238.9%	-58.6%
└ AceBiome	2,170	7,391	5,323	4,767	19,651	4,065	-14.7%	87.3%
└ Others	(618)	(908)	(949)	(620)	(3,095)	(535)	-13.7%	-13.4%
Non-operating Income(Expenses)	2,128	554	(12,669)	6,201	(3,768)	1,256	-79.7%	-41.0%
Income Before Income Tax	20,276	23,198	(12,571)	12,375	43,278	11,655	-5.8%	-42.5%
Net Profit	15,310	17,369	(9,277)	5,796	29,199	9,137	57.6%	-40.3%
Net Margin(%)	*30.7%*	*32.1%*	*-14.5%*	*10.4%*	*13.1%*	*14.9%*	*4.5%p*	*-15.8%p*

IR Contact

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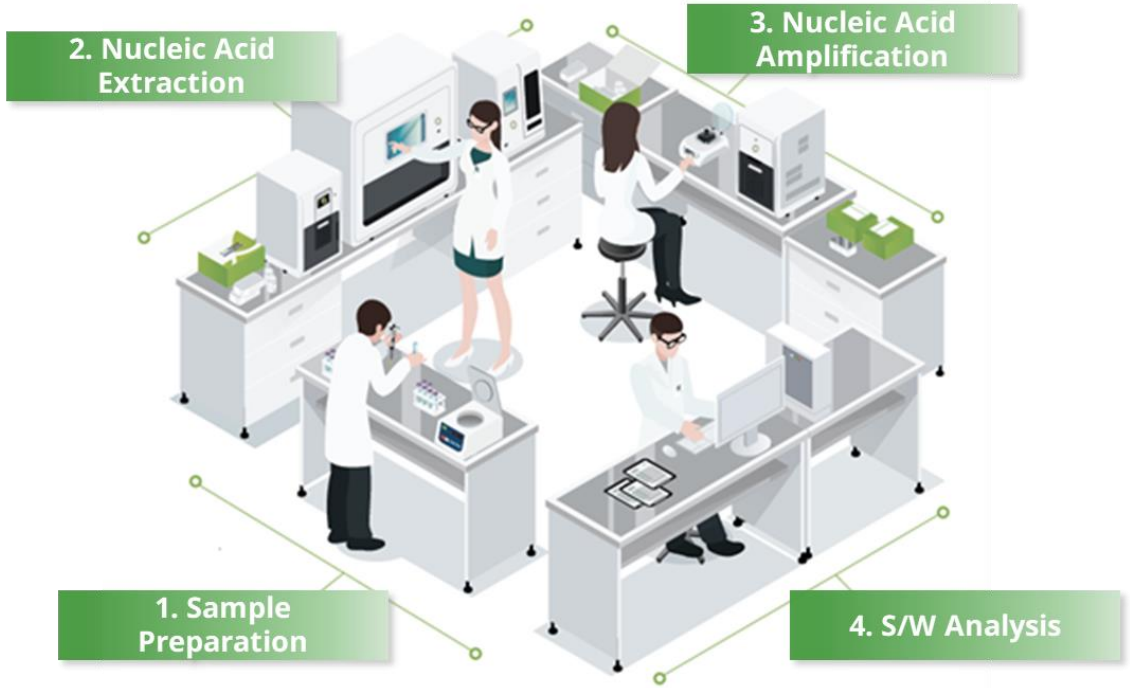
Appendix

Appendix : Molecular Diagnostics

MDx Total Solution Provider



Provided MDx System to 80+ countries worldwide

- Customized MDx solution for each client
- COVID-19 Pandemic : MDx Laboratory Service
- *All-In-House System* from raw materials to the end product enables stable production and supply

Appendix : Molecular Diagnostics

BIONEER MDx Total Solution

BIONEER MDx Ecosystem

60+ Prep Kits

*Prep: PreMix, Kits

45+ Prep Dx

*Prep Dx: Nucleic Acid Extraction

91+ Cycler

*Cycler: PCR Instruments

Configuration	ExiPrep™16Dx (Unit: 1)	ExiPrep™16Dx (Unit: 2)	ExiPrep™16Dx (Unit: 3)	ExiPrep™48Dx (Unit: 1)	ExiPrep™96 Lite (Unit: 1)	ExiPrep™96 Lite (Unit: 2)
	Exicycler™ 96 (Unit: 1)	Exicycler™ 96 (Unit: 1)	Exicycler™ 96 (Unit: 1)	Exicycler™ 96 (Unit: 1)	Exicycler™ 96 (Unit: 1)	Exicycler™ 384 (Unit: 1)
Extraction Kit	ExiPrep™ (K-4471)	ExiPrep™ (K-4471)	ExiPrep™ (K-4471)	ExiPrep™48 (K-4571)	ExiPrep™96 (K-4614)	Protonion™ 96 (K-4731)
Tests/24hr	**168 tests (12 run/1 day)**	**336 tests (12 run/1 day)**	**504 tests (12 run/1 day)**	**644 tests (14 run/1 day)**	**1,316 tests (8 run/1 day)**	**4,136 tests (11 run/1 day)**

Appendix : Molecular Diagnostics

Product Portfolio: 40+ Diagnostic Kits

COVID-19	• COVID-19 Kit • SARS-CoV-2 Kit • SARS-CoV-2 Multiples Kit	CE CE CE
Hepatitis & HIV	• HIV-1 Kit • HBV Kit • HCV Kit	CE 0197 CE 0197 CE 0197
Tuberculosis	• MTB Kit • MTB & NTM Kit • TB & MDR Kit • TB & XDR Kit	CE CE CE CE
Sexually Transmitted Disease	• STI 8A Kit (CT, NG, UU, MG) • STI 8B Kit (TV, MH, HSV1, HSV2) • STI 4C Kit (TP, UP, CA, GV)	CE 0197 CE CE
Respiratory Disease	• InfA Kit • New InfA Kit • CP Kit • MP Kit • MERS-CoV Kit	CE CE CE CE

Transplantation -related Disease	• CMV Kit • EBV Kit • BKV Kit	 CE CE
Gastro-intestinal Disease	• Norovirus Kit • Enterovirus Kit	CE CE
Human Papillomavirus	• HPV 16&18 Kit • HPV Genotyping Kit • hrHPV Kit	CE CE CE
Mosquito-borne Disease	• ZIKV multiplex Kit (ZIKV, DENV, CHIKV)	CE
Genotyping	• ApoE Kit • Warfarin Kit • HLA-B27 Kit • TPMT Kit • MTHFR Kit • JAK2 V617F Kit • Factor V Leiden Kit	CE CE CE CE CE CE

Appendix : Molecular Diagnostics

IRON-qPCR™

	BIONEER IRON-qPCR™	**SD Biosensor** M10	**Cepheid** GeneXpert II
			
Size **W x D x H (mm)**	291 X 265 X 393	Console: 170 X 230 X 390 Module: 140 X 330 X 320	161.3 X 297.2 X 304.8
Sample Capacity	2	1	2
Targets up to	40	5	5
Time to first results	30 min	30-60 min	60 min

Appendix : Molecular Diagnostics

ExiStation™ FA 96/384

	BIONEER ExiStation™ FA 96/384	**Roche** cobas® 6800 system	**HOLOGIC** PANTHER® System	**Abbott** Alinity M
				
Size **W x H x D (cm)**	165 x 75 x 85	292 x 216 x 129	192 x 81.5 x175	249 x 102 x 188
Weight (kg)	150	1,624	574	1,021
Targets up to	20	-	-	-
Maximum throughput (8hr)	672	384	500	300
Time to first results	90 min	150 min	144 min	115 min

Appendix : RNAi Therapeutics

Safety and tolerability of SRN-001

Data by KIT (Korea Institute of Toxicology) & Charles River Laboratories. *NOAEL : No Observed Adverse Effect Level

General Toxicology Study

[a]Single I.V administration of SRN-001 was well-tolerated with no overt toxicity

[b]No significant or dose-dependent changes observed

[b]SRN-001 did not induce drug-related AE

[b]SRN-001 toxicological changes were not seen in all parameters

[a]Mouse Study (NOAEL in mouse > 300mpk) Acute toxicity, 2 Weeks Dose Range Finding(DRF), Repeated Dose 4-Week Toxicity and Toxicokineitc Study with a 2-Week Recovery Period
[b]Monkey Study (NOAEL in monkey > 100mpk) Stepwise dose-escalating study, 2-Week Dose Range Finding, Repeated Dose 4-Week Toxicity and Toxicokineitc Study with a 2-Week Recovery Period

Genetic Toxicology Study

***SRN-001* did not induce genetic toxicity** based on Mammalian Micronucleus Assay, *In Vitro* Chromosome aberration assay, Bacterial Reverse Mutation Assay

Safety Pharmacology Study

SRN-001 did not produce any significant effects based on Irwin test, Respiratory test (Respiratory Function Study), hERG test : hERG Potassium Channel Preliminary Study

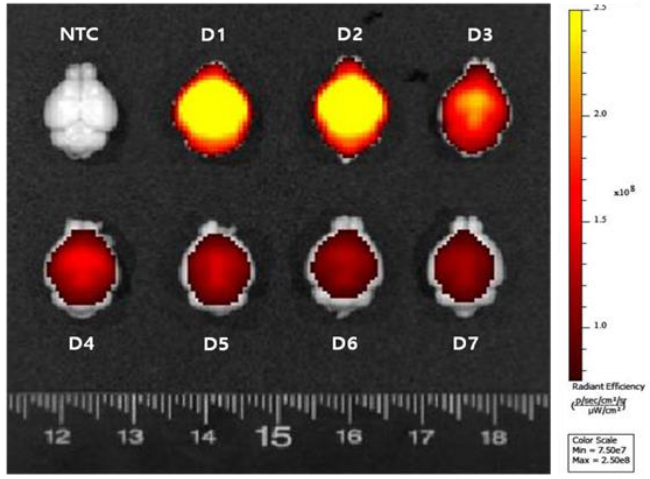
Cardiovascular monkey telemetry Study

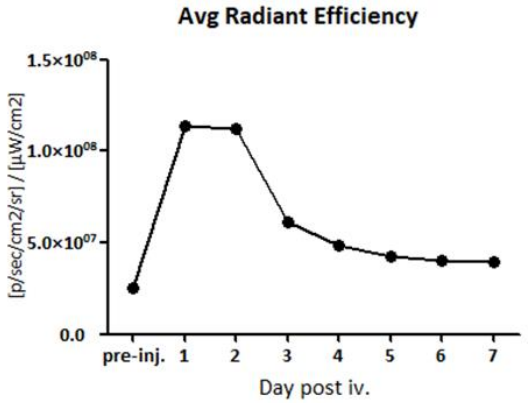
No effects in cynomolgus monkeys at doses of 25-100 mg/kg & NOAEL of SRN-001 was 100mg/kg in monkey

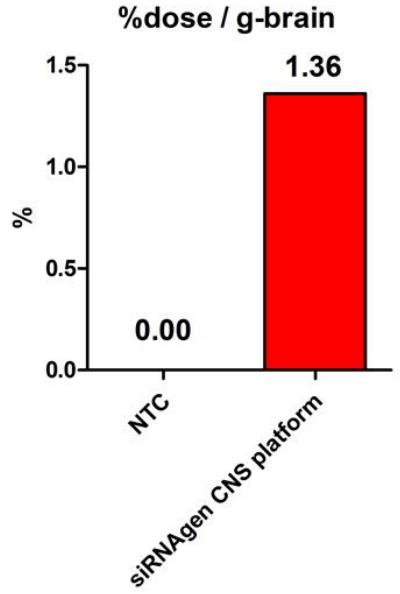
1. International Journal of Toxicology, Vol. 40 issue 5, page(s): 453-465, July 2021
2. Drug and Chemical Toxicology, DOI: 10.1080/01480545.2021.1908003, April 2021
3. Toxicology Reports 8, 839–845, March 2021

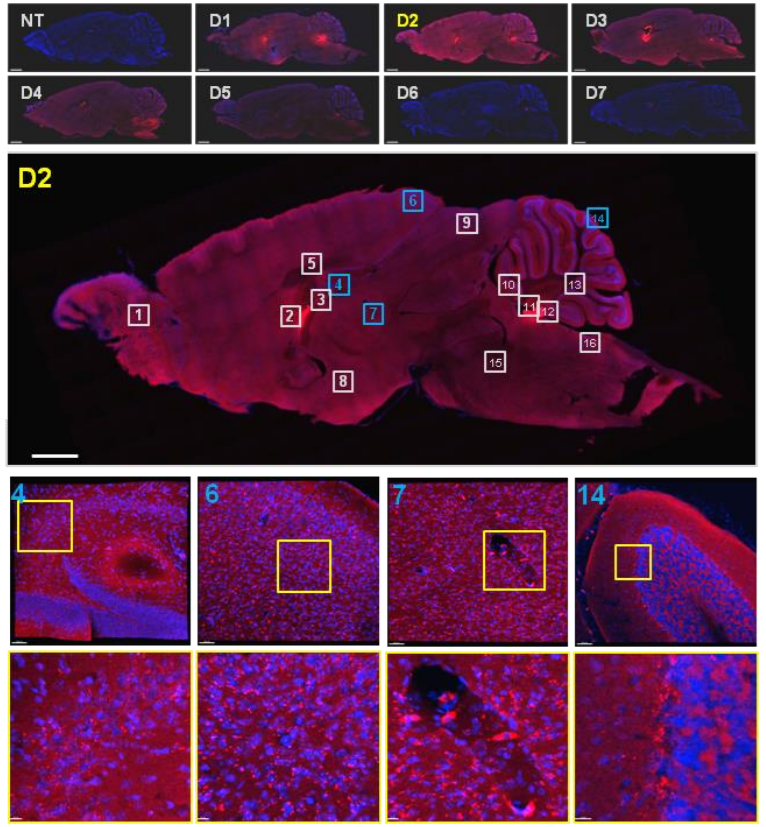
Appendix : RNAi Therapeutics (SRN-008/9)

Successful IV delivery of SAMiRNA to the brain







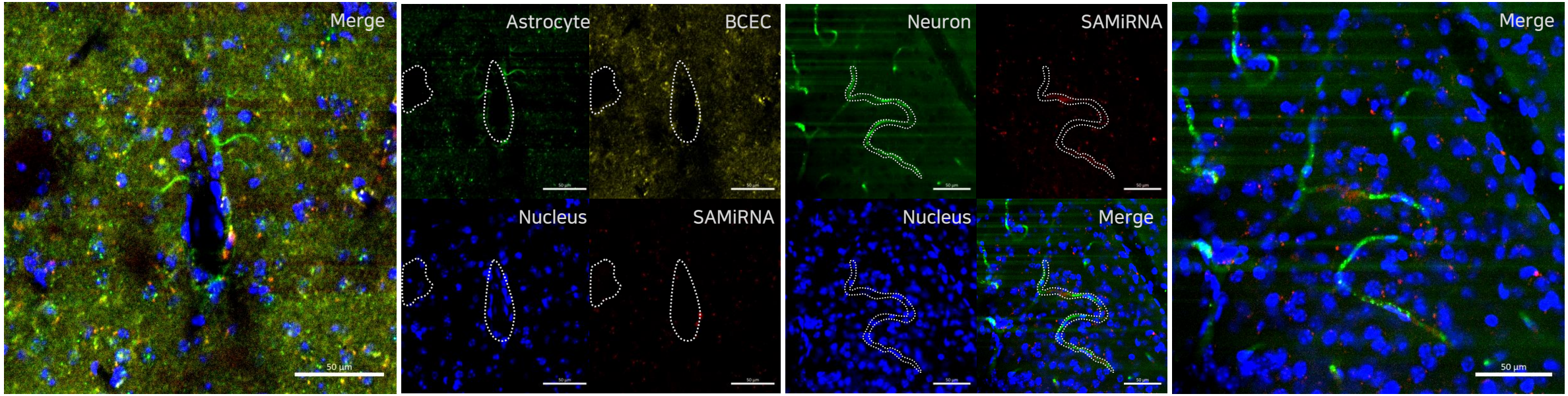


Appendix : RNAi Therapeutics (SRN-008/9)

SAMiRNA crosses through BBB via IV past capillaries into neuronal cells, borrowing knowledge-base from biopharma

Delivery outside the capillaries (crosses BBB)

Delivery into the neuronal cells



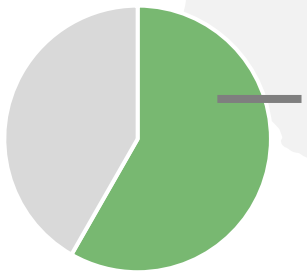
Appendix : CosmeRNA

Androgenetic alopecia (AGA) Market Status

Current therapies bring significant QoL side effects

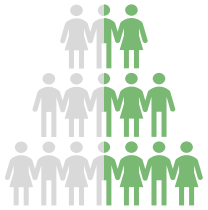
$3.5B

CAGR 6%
global alopecia market (2019)[1]



58% sales from drug stores & retail pharmacies

North America accounts for ½ of global hair loss market with most of the sales coming from drugs stores and retail pharmacies[2]



AGA affects up to **50% of males and females** worldwide and rising[1]

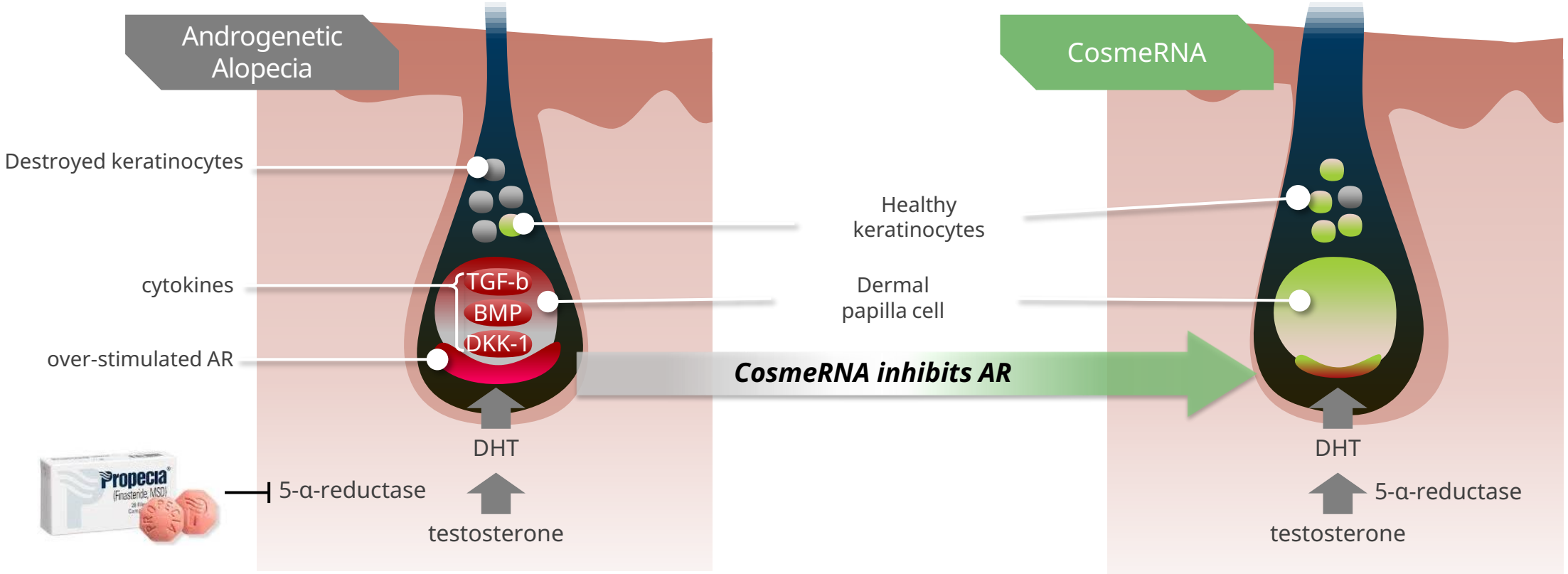
Current available therapies have severe side effects including erectile dysfunction, decreased libido, swelling, male breast cancer, dizziness, headache, rash and inconvenient dosage & administration

1. Data Bridge Market Research, 2020
2. Allied Market Research (AMR), 2021

Appendix : CosmeRNA

Androgenetic alopecia (AGA)

caused by the over-stimulation of androgen receptor, the target of CosmeRNA



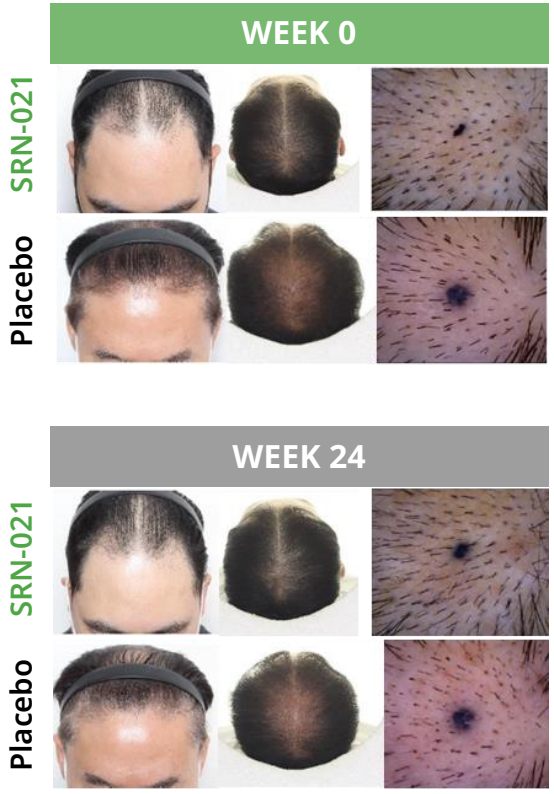
Dihydrotestosterone (DHT) binds to androgen receptor (AR) to induce hair cell apoptosis and hair loss

CosmeRNA inhibits androgen receptor (AR) to prevent hair loss

BIONEER

Appendix : CosmeRNA

Clinical trial as a cosmeceutical showed excellent safety and pharmaceutical-level efficacy



Category	CosmeRNA (n=60)	Best in class (n=3177)
Active ingredient	CosmeRNA	Finasteride
Classification	Cosmeceutical/OTC	Prescription
Formulation	Topcial	Oral
Target	Androgen Receptor Inhibitor	5α-reductase Inhibitor
Usage Count	Once a week	Once a day
Efficacy (per 1 cm^2)	Response rate: 91% Primary end point: +1.9 hairs/mo (7.6 hairs in 4 months)	Response rate: 87.1% Primary end point: +1.6 hairs/mo (9.3 hairs in 6 months)
Side Effect	None	Erectile dysfunction, decreased libido, swelling, male breast cancer, dizziness, headache, skin rash

Yun, SI., Lee, SK., Goh, EA. et al. Weekly treatment with SAMiRNA targetin g the androgen receptor ameliorates androgenetic alopecia. Sci Rep 12, 1607 (2022). https://doi.org/10.1038/s41598-022-05544-w

No drug-related AE in safety study (n=35) nor in the efficacy trial (n=60) were observed in the human clinical trials for cosmeceutical registration in Korea