

World leading drug discovery targeting GPCRs

Corporate Presentation

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World leading drug discovery targeting GPCRs

World leader in GPCR drug discovery and early development

Proprietary GPCR-targeted **StaR® technology** and SBDD platform capabilities

Japan-anchored biotech, with state-of-the-art R&D centre in Cambridge, UK

Listed on Tokyo Stock Exchange (4565-JP)

200+

EMPLOYEES

WORLDWIDE



WORLD-LEADING

PARTNERS

EVOLVING WITH A SPECIALIST THERAPEUTIC FOCUS

Advancing a broad and deep pipeline of **over 40** partnered and in-house programs across multiple therapeutic areas:

- Neurology
- Immunology
- Gastroenterology
- Other

\$700M+

PARTNER REV.

RECEIVED TO DATE¹





¹ Includes upfront and milestone payments, royalties and R&D funding received from active, inactive and completed partnerships from 2005 to 2020.

500+

GLOBAL

PATENTS

340+

STRUCTURES

SOLVED

We can unlock the potential of GPCRs with our StaR[®] technology



Sources: "Unexplored opportunities in the druggable human genome", Nature Reviews, 2016; "Trends in GPCR in Drug Discovery – new agents, targets and indications", Nature Reviews, 2017; Management analyses

Receptors for which a structure has been released in Protein Data Bank (public domain) ••• sosei HEPTARES Receptors for which Sosei Heptares has developed a StaR®



Core capabilities in drug discovery and early development, with a late-stage development team in Japan focused on in-licensing





Established track record of attracting world-leading partners



¹ Encompasses payments received from active, inactive and completed partnerships from 2005 to 2020. ² Includes potential option fees, upfront, development, regulatory and commercial milestone payments and committed R&D funding. Excludes potential royalty payments.



Ten drug candidates generated from our SBDD platform have been successfully advanced into clinical trials



One of the most productive drug discovery teams in the world over the past 10 years

*5 programs (1 x Phase 1, 2 x Preclinical, 2 x Discovery) have been prioritised for academic or industrial partnerships. More information here: https://soseiheptares.com/other-programs-for-partnering



We are continuing to make progress in collaborative drug discovery, having added three new major partnerships over the past year...

Partner	Active Partnered Program	Therapeutic Area	UF / Near Term Payments	Potential deal value ¹
gsk	2020 Collaborat <mark>ion</mark> and Licensing Agreement for GPR35 agonist	Gastrointestinal, immunology	\$44m	\$480m+
biohaven	2020 Collaboration and Licensing Agreement for CGRP antagonist	Neurology	\$10m	\$380m+
abbvie	2020 Discovery Collaboration and Option to License ²	Inflammatory and Autoimmune	\$32m	\$400m+
Takeda	2019 Multi-target Collaboration	Multiple; Initial focus on Gastrointestinal	\$26m	\$1.2bn+
Genentech A Member of the Roche Group	2019 Multi-target Collaboration	Multiple	\$26m	\$1.0bn+
Pfizer	2015 Multi-target Collaboration	Multiple	Nil	\$1.8bn+
AstraZeneca	2015 Collaboration and Licensing Agreement for A _{2a} antagonist ³	Immuno-oncology	\$10m	\$500m+
TOTAL			\$148m	\$5.9bn+
¹ Potential option fees, development, rep ² AbbVie has the option to expand the co	gulatory and commercial milestone payments, plus royalties on globa Illaboration by an additional three targets	l commercial sales;		e e sosei

HEPTARES

³ AstraZenenca have removed the A2a program from their clinical pipeline as at Q3 2021

...and a deep pipeline of exciting in-house programs, plus new technology collaborations, that will form the partnerships of the future



Next wave of COVID-19 therapies – SARS-CoV-2 protease inhibitors







Overview	PAXLOVID™ (PF-07321332; ritonavir) — small molecule oral antiviral treatment; twice a day dosing at first sign of infection / exposure	S-217622 – small molecule oral antiviral treatment; once a day dosing.	SH-879 – small molecule oral antiviral treatment; once or twice daily dosing immediately after a positive test result and for up to 2 weeks after
Phase	Phase 2/3 trial initiated in July 2021 for PF-07321332/ritonavir combo	Japanese Phase 1 trial initiated in July 2021	Potential clinical candidate identified suitable for further development
Key data findings	 Good tolerability, no safety findings up to 500mg dose 2x daily with ritonavir/10 days in HVs Interim analysis found risk of hospitalization or death reduced by 89% compared to placebo in non-hospitalized high-risk adults with COVID-19 Requirement for ritonavir combination boost exposure 	 Animal studies showed ability to decrease the viral load quickly and significantly No safety concerns reported so far 	 Comparable antiviral activity to Pfizer's PF-07321332 against SARS-CoV-2 in cell based assays Low <i>in vitro</i> clearance, superior <i>in</i> <i>vivo</i> clearance and high plasma exposure from oral dosing Does not co-dosing with ritonavir for PK boosting in human clinical trials, unlike Pfizer's PAXLOVID™

Advanced discussions ongoing with a leading global charitable foundation – targeting rapid development of a single agent without the need for co-dosing with other anti-viral therapies



Muscarinic portfolio, led by HTL'878, represents a ready-made HTL'878 neuroscience pipeline of multiple potential blockbuster programs

Program	Compound	Indication	Discovery	Preclinical	Phase 1	Phase 2	Next Milestone 12-18 months
M₄R	HTL'878	Schizophrenia					Phase 2 ready
ortho agonist	Not disclosed	Schizophrenia					Completion of Phase 1 SAD
M ₁ R/M ₄ R dual ortho agonist	Not disclosed	Schizophrenia & Alzheimer's cognition & psychosis					IND ready
M ₁ R	HTL'318	Alzheimer's Dementia Lewy Bodies					Regulatory consultation
pathfinders	HTL'936	Alzheimer's Dementia Lewy Bodies					Clinical PK
M₁R ortho agonist	Not disclosed	Alzheimer's Dementia Lewy Bodies					IND ready

Negotiations progressing well with multiple potential global development/co-development partners. Current intention remains to partner all programs in order to aggressively accelerate their development

Key: Full box = completed phase. Striped box = next milestone



HTL'878 is a 4th-generation candidate aiming to be a highly effective and safer treatment for Schizophrenia

					Efficacy			Safety			
					Positive symptoms	Negative symptom	Cognitive impairment	Extrapyramidal symptoms ^{**}	Weight gain		
	MoA	Typical medicine	Peak sales example	Generation	Number of patients 20M*	Number of patients 11.5M [*]	Number of patients 16M^{*}	-	-		
Typical antipsychotic	D2 Ant	Haldol	(Historic data unavailable)	1 st	+++			++++	+		
Atypical antipsychotics	D2 Ant + 5-HT Regulator	Zyprexa Risperdal Latuda	Zyprexa \$5,000M+ (2010)	2 nd	+++	+	+	++	++++		
	D2 partial Ag + 5-HT Regulator	Abilify REXULTI Vraylar	Abilify \$6,100M+ (2013)	3 rd	+++	+	+	+	+		
	M4 Agonist ^{***}	KarXT CVL-231 HTL'878	-	4 th	+++	++	++	-	-		

After regaining the program in early 2021, we rapidly invested behind HTL'878

*As 1 patient can have several symptoms, number of patients in 3 symptoms is overlapping

**Drug-induced movement disorders including involuntary or uncontrollable movements. tremors. muscle contractions. It is said to be related with D2 receptor occupancy balance.

***Expected efficacy and expected safety derived from ongoing clinical trials of KarXT and CVL-231.

12 Source : P T. 2014 Sep; 39(9): 638–645, J Clin Psychiatry. 2010;71(3):280–286, Schizophr Bull. 2010 Jan; 36(1): 36–42 and EvaluatePharma



HTL'878

HTL'878 is differentiated and is the only highly selective HTL'878 orthosteric agonist of the muscarinic M4 receptor in development

Direct agonism of M₄R is a clinically validated target for psychoses

- Direct agonism of the muscarinic M₄ mechanism is a clinically validated target for the treatment of psychoses (Xanomeline, KarXT), underpinned by strong non-clinical science from around the world
- HTL'878 has been shown to act via selective direct agonism of the M_4R in non-clinical species and also in humans

HTL'878 is an orthosteric partial direct M₄R agonist with a potentially improved sideeffect profile

- HTL'878 is an orthosteric partial direct M₄R agonist with a potentially improved side effect profile in comparison with the front-runner (KarXT) and likely CVL-231
 - HTL'878 has much better selectivity and a potentially improved side-effect profile than KarXT
- CVL-231 is a Positive Allosteric Modulator (PAM) which therefore requires ACh tone in the CNS making it difficult to achieve a margin over CV side effects
- Efficacy of an orthosteric agonist does not depend on cholinergic tone, unlike a PAM we expect also stronger efficacy in Dementia Related Psychosis than a PAM which is unlikely to be effective

Of the fourth-generation treatments in development, HTL'878 stands out as a potentially superior approach



Looking forward

Strategic growth plan driving corporate value expansion



Seeking to add new revenues, access new technologies, and expand and future-proof our capabilities



Three big challenges in drug discovery and development

KEY OPPORTUNITY



- Will modulating the target affect disease?
- Can a good modulator of the target be found?

Discovering a therapeutic agent

- Identifying a modulator with the appropriate profile
- Differentiating from competitors (if any)

Conducting the right patient studies

- Demonstrating the value of the agent in treating disease
- Utilizing biomarkers to support patient stratification

Our greatest opportunity is to leverage technology to choose the right drug targets that will become the transformational therapies of the future



We have created the New target ID and validation (TIV) framework to accelerate our quest to choose the right targets

Aim	To support the identification and validation of new drug GPCR targets across our core therapeutic areas (GI, immunology, immuno-oncology and neuroscience)	e Learning	Bioinformatics	Proteomics
How	By leveraging top-end external company omics platforms/databases and validation capabilities	AI / Machin	platform Small Molecule	Genomics
Why	To add exciting novel GPCR targets to our pipeline which have evidence of a direct involvement in a disease / mechanism process to fuel partnering activity and higher value creation		Discovery Clinical Trials	Clinical/ Patient Data

Continuously expanding our know-how and SBDD platform to maintain our leadership position in GPCR drug discovery



ptomics

Date

New TIV Framework - mid-term plan to pursue investments and external collaborations to hunt novel first-in-class drug targets



Over the next 6-12 months you will see us expand our external technology collaborations and alliances

Note: PE = Protein Engineering; BMS = Biomolecular Structure; TV = Target Validation; HID = Hit Identification; H2L = Hit-to-Lead; LO = Lead Optimization



Priority objectives for FY2021/FY2022

Progress organic growth plan

- Extend technology / platform leadership
- Generate high quality novel candidates
- Advance discovery and development pipeline
- Execute high value partnerships



- Invest / collaborate in novel technologies
- Diligence potential strategic
 M&A opportunities
- Diligence potential opportunities for Japan
- Expand drug target classes beyond GPCRs



- Promote sustainable ESG practices and policies across global business
- Advance Mpro inhibitor program and seek collaboration to further develop candidates as oral treatments for human coronaviruses



Appendix

Progression of Partnered Pipeline

FY2020 stage FY2021-Now progress

Compound	Target / Mechanism of Action	Modality	Indication	Partner	Disc.	PCC	Ph1	Ph2	Ph3	Арр	Mkt
Traditional Out-licensing	Collaborations										
Seebri [®] Breezhaler [®]	LAMA	SME	COPD	🔥 novartis				_		_	
Ultibro [®] Breezhaler [®]	LAMA+LABA	SME	COPD	🔥 novartis				_		_	
Enerzair [®] Breezhaler [®]	LAMA+LABA+ICS	SME	Asthma	U NOVARTIS		_					
ORAVI®	Antifungal agent miconazole	SME	Oropharyngeal candidiasis	Alisamitsu		_		_		_	
Imaradenant**	Adenosine A2a ant. combo	SME	mCRPC	AstraZeneca							
PF-07081532	GLP-1 agonist	SME	T2DM / Obesity	Pfizer							
PF-07054894	CCR6 antagonist	SME	Inflammatory bowel disease	P fizer			_				
PF-07258669	MC4 antagonist	SME	Anorexia	P fizer			-				
BHV3100	CGRP antagonist	SME	Neurology diseases	pharmacevilcals		-	_				
Not disclosed	GPR35 agonist	SME	Inflammatory bowel disease	gsk		_					
Not disclosed	Multi target	SME	Multiple indications	Pfizer							
Not disclosed	Multi target	SME/LME	Multiple indications	Genentech A Member of the Roche Group							
Not disclosed	Multi target	SME/LME	Gastrointestinal and other	Takeda							
Not disclosed	Single target	SME	Inflammatory diseases	abbvie							
Co-development / Profit-	share Collaborations										
KY1051	CXCR4 mAb	mAb	Immuno-oncology	sanofi 🎝 kymab		_					
Not disclosed	PAR-2	Peptide	Inflammatory diseases	ReptDream							
Not disclosed	Targeted Protein Degradation	SME	Gastrointestinal disorders	Captor Therapeutics®							
Not disclosed	AI-Augmented Drug Discovery	SME	Neurology diseases								
Not disclosed	Ion Channel Drug Discovery	SME	Neurology diseases								
Not disclosed	Multi target AI-powered	SME	Immune diseases	Inveni 🔕							
Co-owned investments											
TMP301	mGlu5 NAM	SME	Substance use disorders	Tempero. Bio							
Not disclosed	OX1/OX2 agonist(oral and intranasal)	SME	Narcolepsy								



Note: SME = small molecule. LME = large molecule. Seebri[®], Ultibro[®], Enerzair[®] and Breezhaler[®] are registered trademarks of Novartis AG. ** ** AstraZenenca have removed the A2a program from their clinical pipeline as at Q3 2021

Progression of In-house Pipeline

FY2020 stage FY2021-Now progress

Compound	Target / Mechanism of Action	Modality	Indication	Originator	Dis	PCC	Ph1	Ph2	Ph3	Арр	Mkt.
In-house Programs (Not	yet partnered)										
HTL'878	Muscarinic M4 agonist	SME	Neurology diseases	SOSEI HEPTARES							
HTL'318 ¹	Muscarinic M1 agonist	S <mark>ME</mark>	Neurology diseases	SOSEI HEPTARES							
HTL'936	Muscarinic M1 agonist	SME	Neurology diseases	SOSEI HEPTARES			_				
Not disclosed	Muscarinic M1 agonist (B/U)	SME	Neurology diseases	SOSEI HEPTARES							
Not disclosed	Muscarinic M4 agonist (B/U)	SM <mark>E</mark>	Neurology diseases	SOSEI HEPTARES							
Not disclosed	Muscarinic M1/M4 agonist	SME	Neurology diseases	SOSEI HEPTARES							
Not disclosed	H4 antagonist	SME	Atopic Dermatitis	SOSEI HEPTARES							
Not disclosed	EP4 antagonist	SME	Immuno-oncology	SOSEI HEPTARES							
Not disclosed	GPR52 agonist	SME	Neurology diseases	SOSEI HEPTARES							
Not disclosed	PAR-2 mAb	mAb	Atopic Dermatitis	SOSEI HEPTARES							
SH-879	SARS CoV-2 Mpro	SME	Coronaviruses	SOSEI HEPTARES	_						
Not disclosed	EP4 agonist	SME	Inflammatory bowel disease	SOSEI HEPTARES	_						
Multiple programs	Not disclosed	SME/LME	Neurology diseases		_						
Multiple programs	Not disclosed	SME/LME	GI and Inflammatory diseases	SOSEI HEPTARES							
Multiple programs	Not disclosed	SME/LME	Immunology diseases		_						
In-house Programs (No I	onger internally funded. Targetir	ng academic / ind	lustrial partnership)								
HTL'310	SSTR5 agonist	Peptide	Hypoglycaemic disorders								
HTL'097	GLP-1 antagonist	Peptide	Hypoglycaemic disorders								
HTL'023	Dual GLP-2/GLP-1 agonist	Peptide	Intestinal failure / NASH								
Not disclosed	Apelin agonist	Peptide	Pulmonary Arterial Hypertension								
HTL'641	Dual orexin antagonist	SME	Insomnia and sleep disorders	SOSEI HEPTARES							



Note: SME = small molecule. LME = large molecule. ¹ Voluntarily suspended

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