Addex Corporate Presentation

December 2018

Innovative Treatments for Central Nervous System Disorders

SIX: ADXN



Allosteric modulators for human health

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Addex Overview

Swiss Company SIX Listed

Dipraglurant for Parkinson's Disease Founded in 2002 & headquartered in Geneva

- Traded on the SIX Swiss Stock Exchange since 2007 ADXN
- 28.6M shares and market cap of CHF70M
- Cash of CHF43.6m at 30 June 2018
- Runway through 2021
- US PD-LID market estimated at \$4.2B
 - FDA Orphan Drug Designation granted in PD-LID
- Positive Phase 2 in PD-LID
- Registration trials scheduled to start H2 2019

Addex Pipeline and Technology Platform

- Validated differentiated pharmacological approach
 Proprietary biological screening assays and chemical library
 Partnership with Indivior PLC on GABAB PAM
- Partnership with J&J on mGluR2 PAM





Experienced Team

- Executive Management:
 - Tim Dyer, CEO / CFO
 - Co-founder of Addex, formerly with PwC
 - Roger Mills, CMO
 - Formerly with Acadia Pharmaceuticals
 - Robert Lutjens, Head of Biology
 - Formerly with Glaxo, The Scripps Res Inst.
 - Jean-Philippe Rocher, Head of Chemistry
 - Formerly with Pierre Fabre, GSK, Mitsubishi
- Team of Experts:
 - Hilde Williams
 - Regulatory Affairs, Former SVP Regulatory Acadia Pharmaceuticals
 - Ron Lawrence
 - CMC; Formerly with GSK

- Clinical Advisors:
 - PD-LID
 - Michael J. Fox Foundation for Parkinson's Research
 - Dr. Erwan Bézard
 - Prof. Chris Goetz
 - Prof. Stuart Isaacson
 - Dystonia
 - Dystonia Medical Research Foundation
 - Prof Hyder Jinnah
 - Prof. Antonio Pisani
 - Dr. Jan Teller
- Board Members:
 - Vincent Lawton, Chairman
 - Former European Head of Merck & Co., MHRA
 - Ray Hill
 - Former Executive Director at Merck & Co.
 - Jake Nunn, New Enterprise Associates
 - Isaac Manke, New Leaf Venture Partners



Clinical Stage Pipeline with Lead Program Entering US Pivotal Study Multiple Orphan Drug Opportunities

Molecule / MoA	Preclinical	Phase 1	Phase 2	Phase 3 Pivotal
Dipraglurant-IR (mGluR5 NAM)	Parkinson's disease levodopa-indu	uced dyskinesia		
Dipraglurant-ER (mGluR5 NAM)	Focal cervical dystonia			
ADX71149 (mGluR2 PAM)	Epilepsy			
ADX71441 (GABAB PAM)	Addiction			





NAM = Negative Allosteric Modulator PAM = Positive Allosteric Modulator

Extensive Preclinical Stage Pipeline for Long-Term Growth

Molecule / MoA	Hit to Lead	Lead Optimization	Clinical Candidate	Patient Groups, Government and Academic Collaborators
mGluR4 PAM	Parkinson's Disease			C - UI/
mGluR2 NAM	Mild Cognitive Impairment			NEUR I.R.C.C.S.
GABAB PAM	Charcot-Marie-Tooth 1A			CHARCOT MARIE TOOTH ASSOCIATION
mGluR7 NAM	Psychosomatic Disorders (P1	rsd)		NIH National Institute on Drug Abuse
mGluR3 PAM	Neurodegenerative Disorders			NEURO INTUTO I.R.C.C.S.
TrkB PAM	Neurodegenerative Disorders			UNIVERSITÉ DE GENÈVE FACULTÉ DE MÉDECINE



NAM = Negative Allosteric Modulator PAM = Positive Allosteric Modulator

Dipraglurant in Parkinson's Disease



The Dipraglurant Opportunity in Parkinson's Disease

Important Unmet Need in PD-LID	 >1M PD patients in US of which >170,000 have dyskinesia Gocovri (reformulated generic amantadine): Approved Aug 2017
Dipraglurant: Unique Mechanism of Action	 First-in-class, selective, oral small molecule mGluR5 NAM PK profile mirrors that of L-dopa, making it ideal to treat LID Inhibits abnormal glutamate stimulation during L-dopa dosing
Significant Commercial Opportunity	 US LID market estimated at \$4.2B Dipraglurant US peak sales estimated at \$1.4B Significant recent increase in pricing of PD therapeutics – Nuplazid at \$30K p.a. and Gocovri at \$28.5K p.a.
Development & Regulatory Path	 Manufacturing & planning for registration studies ongoing Precedented FDA regulatory path.
Strong IP Position	 Composition of matter through June 2025 & strong polymorph patent through 2034 without extensions US FDA orphan drug designation in PD-LID



Levodopa-Induced Dyskinesia in Parkinson's Disease (PD-LID)

- Long-term L-dopa use is invariably associated with the development of dyskinesias as disabling as the PD symptoms themselves
- Prevalence of LID is related to disease duration
 - Within 4-6 years of L-dopa treatment, LID is experienced by <u>>40% of patients</u>
 - By 9 -15 years of L-dopa treatment, LID affects 90% of PD patients
 - Next-generation L-dopa will not negate LID
- Dyskinesias result from the neurodegenerative process that underlies PD.
- Dopamine replacement does not lead to dyskinesia per se, but lowers the triggering threshold for symptoms.
- Patients with LID present with irregular migrating uncontrollable contractions or twisting and writhing due to dystonia, chorea, and choreoathetosis.
- Over time PD drugs become less effective, exacerbated by the emergence of LID, which limits tolerability of the drugs
- The constant dyskinetic movements can be painful, lead to weight loss, fatigue and exhaustion, with increased risk for falls and injuries.
- Patients are embarrassed and withdraw from social interaction leading to isolation, frustration and depression.
- This diminishes the patient's quality of life but it also significantly increases the burden on the caregiver.
- The doctor is faced with a balancing act where drug and dosing regimens must be continually optimized in order to ensure adequate symptom control while minimizing intolerable side effects.



Dipraglurant - Overview & Mechanism of Action



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- Loss of substantia nigra neurons combined with the non-physiological, pulsatile stimulation of dopamine receptors are at the basis of LID development
- In the striatum, LID is the result of:
 - D1 receptor priming
 - Abnormal glutamate transmission
 - Loss of LTP depotentiation
- Metabotropic glutamate receptors are attractive drug targets due to their modulatory action to normalize glutamatergic activity and restoration of LTP depotentiation
- mGlu5 receptors are implicated in the control of glutamate transmission
- Preclinical and clinical data show that mGluR5 blockade controls dyskinesia
- Dipraglurant is an oral small molecule active as a highly selective negative allosteric modulator at the mGlu5 receptor with the potential to treat LID

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Dipraglurant PK is a Key Advantage for Treating LID



- Dyskinesia symptoms are correlated to peak levels of levodopa therapy
- PK profile of dipraglurant mirrors that of levodopa
- Dipraglurant inhibits abnormal glutamate stimulation during peak levodopa dose but releases the receptor during normal glutamate activity

Dipraglurant PK/PD Profile is Ideal for Treating LID



Dipraglurant EU and US Phase 2a Study in LID Multicentre study in 25 centres across US and Europe



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N= number of patients; R= randomization

Coordinating Investigator: Prof Olivier Rascol at University Hospital, Toulouse, France

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Dipraglurant Reduces LID Severity by 30%



Mean % change of peak mAIMS from baseline			
Midday dose	Dipraglurant	Placebo	
Day 1 (50 mg)	19.9%	4.1%	
Day 14 (100 mg)	32.3%	12.6%	
Day 28 (100 mg)	31.4%	21.5%	



- Dipraglurant had a statistically significant effect on the first day
- Dipraglurant reduced dyskinesia compared to placebo at all visits over the 28 days
- Placebo response confounded significance at day 28
- Dose titration contributed to placebo response (patients only on full dosage for last 7 days)
- No placebo-mitigating techniques deployed in study:
 - No centralized raters
 - No independent raters
 - Rater not blinded to visit number
 - Patients were more moderate than severe

Responder Analysis Demonstrates Dipraglurant Significant Benefit

Cumulative % of Patients Showing ≥ 30% Change of Peak mAIMS from Baseline



Responder analysis (≥30% change of peak mAIMS from baseline)					
Midday dose	Dipra	glurant	Pla	acebo	p-value
Day 1 (50 mg)	n=13	26.0%	n=3	12.5%	0.2377
Day 14 (100 mg)	n=29	56.9%	n=6	25.0%	0.0132
Day 28 (100 mg)	n=27	55.3%	n=7	29.2%	0.0474



- A 30% reduction in mAIMS is clinically meaningful
 - One patient was able to hold & read a newspaper for the first time in years
 - Another patient had improved speech and became more easily intelligible

Responder analysis reinforces robustness of dipraglurant anti-dyskinetic effect



Clinician Rated Global Impression of Change - Dyskinesia



17.3%

45.8%

- Relatively simple scale that reflects everyday clinical practice
- Assessment by treating physician and thus is a more objective assessment than the more subjective mAIMS
- Assessment performed at end of study compared to baseline
- Greater improvement in dyskinesia with dipraglurant according to clinicians (p<0.05)



No change

Patient Diaries – Improvement Throughout the Waking Day



After 4-week treatment with dipraglurant:

- ON time <u>with dyskinesia</u> reduced during the day
- ON time <u>without dyskinesia</u> increased and maintained during the day





Dipraglurant 50 and 100 mg Doses Demonstrated Safety and Satisfactory Tolerability in PD Patients

- Adverse events were common in both treatment groups (dipraglurant 88.5%, pbo 75%)
- The majority of patients completed the dose escalation regimen
- Most common AEs:

	Dipraglurant	Placebo
Worsening Dyskinesia	21% (15.3% *)	12.5%
Dizziness	19%	12.5%
Nausea	19%	0%
Fatigue	15%	4%

 3 of the 11 patients who reported "worsening dyskinesia" did so only in the follow up period (i.e. when not taking the drug). Thus the dyskinesia recurred only after therapy had stopped. Therefore the adjusted AE% is 15.3% for dipraglurant arm vs.12.5% for placebo arm.

- AEs caused discontinuation in 2 patients taking dipraglurant 100 mg
- AEs at the 50 mg dose level (wk 1 and 2) were less frequent 53% vs 58% pbo than at the 100 mg dose level (wk 3 and 4) 73% vs 63% pbo
- No treatment effects on any safety monitoring variables (ECG, HR, BP, haematology and biochemistry)

Safety profile suitable for continued development in PD (KOLs and DSMB)



Summary of Efficacy Data

- Dipraglurant showed a clinical meaningful improvement of dyskinesia
 - Significant improvement of mAIMS on Days 1 and 14
 - Trial design exacerbated placebo response confounding significance at Day 28
 - Responder analysis (≥30% improvement) demonstrates clinically meaningful and statistically significant benefit on Days 14 and 28
 - Investigator assessed CGIC shows dipraglurant significantly improved dyskinesia over placebo during the study (p<0.05)
- Did not impair motor function (UPDRS) important consideration for FDA
- Dipraglurant effects in patient-reported outcomes:
 - 50-minute reduction in "OFF time" by week 4
 - 2.3 hours more "ON time" without dyskinesia by week 4
- Dipraglurant 50 and 100 mg doses demonstrated safety and satisfactory tolerability in Parkinson's disease patients



Clinical Development Plan

- Pivotal trials:
 - Two studies required for registration
 - Primary endpoint: UDysRS more sensitive to treatment effect than mAIMS and less prone to placebo response (Goetz 2013)
 - Pivotal Study 1 (301) 13 weeks
 - Pivotal Study 2 (302) 26 weeks (primary endpoint at 13 weeks)
 - Open label extension
 - Measure to minimize placebo response integrated in pivotal study design
- Toxicology:
 - 6 and 9 month toxicology
 - 3 month combination toxicology study in one species before large studies start
- Regulatory:
 - Continue to interact with regulatory bodies
 - Consider fast-track / breakthrough applications after first pivotal study



Management of Placebo Response

Objective	Strategy
 Minimize rater variability (across and within sites) 	Use independent (centralized) raters
 Reduce expectancy bias 	 Raters blinded to visit and do not rate the same patient at baseline and study endpoint
 Exclude patients with minimal symptoms (as more likely to respond to placebo) 	 Ensure that symptom score reflects moderate to severe symptoms that warrant therapy Ensure occur frequently enough for scale sensitivity
 Exclude potential investigator rating inflation 	 Independent oversight of screening and use of centralized rater baseline visit score as study entry gate
 Draw placebo response ahead of randomization 	 Consider non-pharmacologic intervention during screening period
 Ensure no geographic bias 	 Only include countries / sites where centralized rating is feasible



Dyskinesia Rating Scales: UDysRS verses mAIMS

	UDysRS	mAIMS
Characteristics	 Recommended scale by Movement Disorder Society FDA regulatory NDA precedent (Adamas - Gocovri) Contains anchored objective clinician evaluated measures of dyskinesia UDysRS has both patient-based perceptions of disability and physician assessments of impairment and disability embedded in the single scale Less prone to placebo effect 	 mAIMS alone was identified as suboptimal in detecting treatment- related changes mAIMS patient driven More prone to placebo effect
Clinimetric properties	Validated	 Only the original version has been validated
History	 Developed in 2009 specifically for dyskinesia in PD patients 	 Developed in 1970 to assess tardive dyskinesia in psychiatric patients



Dipraglurant 1st Pivotal LID Study (301)



N= number of patients; R= randomisation; LID= L-Dopa induced dyskinesia; OLE = open label extension



Dipraglurant 2nd Pivotal LID Study (302)



N= number of patients; R= randomisation; LID= L-Dopa induced dyskinesia; OLE = open label extension



Dipraglurant LID Opportunity

- LID has a large unmet need and market opportunity
 - > 170K LID patients in US
 - ~\$1.4bn US market opportunity for dipraglurant
- Limited competition only one FDA approved medicine
 - Gocovri (reformulation of generic amantadine): Approved on 24th August 17 safety profile similar to generic
 - Dipraglurant 1st in class highly selective oral monotherapy improved safety profile
- Development plan defined
- Precedented regulatory path paved by Gocovri (Adamas)
 - Two registration trials
 - Ideal PK profile mirrors levodopa recognized by KOLs as key advantage
- Strong patent and market exclusivity
 - NCE and polymorph patent provide protection through 2034 without extensions and data exclusivity
 - Orphan Drug Designation 7 years of market exclusivity



Preclinical Programs



Indivior Partnership on GABA_B PAM for Addiction

- GABA_B is the metabotropic receptor for GABA, main inhibitory neurotransmitter
- Activation of GABA_B is validated through the use of baclofen (GABA_B orthosteric agonist)
 - Approved for the treatment of spasticity
 - Clinical efficacy in alcoholism and Charcot-Marie-Tooth type 1A (CMT1A)
- Positive Allosteric Modulator (PAM) is a differentiated pharmacological approach
 - Potential safety and efficacy advantages lack of tolerance and less side effects
- Worldwide license and collaboration on GABA_B PAM
- Indivior leading development of ADX71441 in addiction
- Addex leading funded research effort to deliver back up compounds
 - Addex has right to select back up compounds at clinical candidate stage for development in retained indications including CMT1A neuropathy
- Financial terms:
 - Upfront of USD 5 million & USD 4 million research funding over 2 years
 - USD 330 million of development, regulatory and commercial milestones
 - Tiered royalties up to double-digit royalties



mGluR4 PAM Program for Parkinson's Disease

• Overview :

- novel non-dopaminergic approach to treat Parkinson's disease with potential to treat both motor and non-motor symptoms, disease modifying neuroprotective potential:
 - Motor functions: in acute and chronic preclinical models of PD, mGluR4 PAM demonstrated improvement
 - Neuroprotection: effect in MPTP mice model demonstrated with mGluR4 PAM
 - Non-motor (anxiety): mGluR4 activators demonstrated anxiolytic-like response in preclinical rodent models
- Potential to treat a broad range of debilitating autoimmune disorders linked to aberrant TH17 responses, including rheumatoid arthritis, psoriasis, inflammatory bowel disease and uveitis
- -Raised interest in field following recent acquisition of Prexton Therapeutics by Lundbeck
- Status:
 - -Late lead optimization progressing towards IND-enabling studies
 - Several novel chemical series with potent, selective, orally bioavailable and brain penetrant compounds
 - -Significant novel IP in the field



mGluR2 NAM Program for Mild Cognitive Impairment

- Overview :
 - Potential to treat medical conditions linked to lowered glutamate levels in the brain via restoration of a normalized glutamatergic tone
 - Alzheimer's Disease (AD) : cognitive deficits and possible disease-modifying effect (slowing disease progression via reduction of build-up of amyloid β induced by mGluR2 activation (Kim et al) and reducing chromogranin A-induced microglial neurotoxicity (Taylor et al)
 - Major Depressive Disorder: ketamine-like antidepressant efficacy in depressed patients whilst avoiding the NMDA associated negative effects of ketamine.
- Status:
 - -Late lead optimization progressing towards IND-enabling studies
 - Several novel chemical series with potent, selective, orally bioavailable and brain penetrant compounds
 - Significant novel IP in the field



GABA B PAM Program for Charcot-Marie-Tooth 1A Neuropathy

- Overview :
 - -GABAB is the metabotropic receptor for GABA, main inhibitory neurotransmitter
 - -Activation of GABAB is validated through the use of baclofen (GABAB orthosteric agonist)
 - Approved for the treatment of spasticity
 - Clinical efficacy in alcoholism and Charcot-Marie-Tooth type 1A (CMT1A)
 - Positive Allosteric Modulator (PAM) is a differentiated pharmacological approach
 - Potential safety and efficacy advantages lack of tolerance and less side effects
- Status:
 - -Late lead optimization progressing towards IND-enabling studies
 - Several novel chemical series with potent, selective, orally bioavailable and brain penetrant compounds
 - -Significant novel IP in the field



mGluR7 PAM Program for PTSD & Hearing Loss

- Overview :
 - Based on mGlu7 receptor knockout mice phenotype & mGlu7 receptor pharmacological inhibition studies, negative allosteric modulators show strong potential for anxiety related disorders such as PTSD
 - In addition, other potential indications include pain, neuroprotection, schizophrenia, ADHD, age-related hearing impairment, tinnitus...
- Status:
 - -Late lead optimization progressing towards IND-enabling studies
 - Several novel chemical series with potent, selective, orally bioavailable and brain penetrant compounds
 - -Significant novel IP in the field



mGluR3 PAM Program for Neurodegenerative Diseases

- Overview :
 - -Novel mechanism of action for treatment of neurodegenerative disorders & schizophrenia
 - Strong rational and preclinical validation through:
 - Schizophrenia: studies demonstrate GRM3 gene variants association; mGlu3 receptor KO mice exhibit a "schizophrenia-like" phenotype
 - Neurodegenerative diseases: demonstrated neuroprotective effects, with "dual" action: reduction of glutamate release, potentially lowering excitotoxic insult; and stimulation of production of growth factors such as BDNF, GDNF & TGFβ1
- Status:
 - -Lead generation stage
 - Several novel chemical series identified from internal screening of corporate library with proprietary screening tools
 - Most potent and selective mGlu3 PAMs ever described first in class potential
 - -Significant novel IP in the field



TrkB PAM Program for Neurodegenerative Diseases

- Overview :
 - TrkB is the receptor for BDNF (brain-derived neurotrophic factor)
 - TrkB activation is preclinically validated
 - neurodegenerative diseases Alzheimer's, Parkinson's, or Huntington's disease
 - potential for both disease-modifying and symptomatic treatment
 - -PAM approach enabled identification of novel chemistry
- Status:
 - -Lead generation stage
 - -Supported with grants from Michael J Fox Foundation and InnoSuisse
 - Collaboration with University of Geneva access to complex *in vitro*, *ex vivo* and *in vivo* models to probe neuroprotective and neurogenesis potential of TrkB PAMs



Medicine Chest / Wellcome Trust ADX10061 Grant

- ADX10061 is a selective D1 receptor antagonist
- THuNDR2 initiative awarded £1.2 million grant from the Wellcome Trust
 - Manufacture ADX10061
 - Investigator-led clinical studies to understand role of D1 receptors
- THuNDR2 is led by Prof David Nutt from Imperial College London and includes universities of Cambridge, Bristol, Exeter, Oxford & Kings College London
- ADX10061 include in ECNP Medicines Chest
 - Available to European neuopharmacologists
- THuNDR2 could provide a potential new indication for development of ADX10061



World Leading Allosteric Modulator Discovery Platform



Allosteric Modulation Drug Discovery Platform

- Proven track record
 - Pipeline of in house discovered drug candidates
 - mGluR5 NAM & mGluR2 PAM in clinical studies
 - Novel chemistry for GABAB, mGluR4, mGluR2, mGluR3, mGluR7 and TrKB
 - Proprietary biological tools for screening and medicinal chemistry support
 - Drug like allosteric biased chemical library
 - Significant in-house expertise
- Platform & preclinical strategy
 - Continue to invest in allosteric modulation expertise
 - Leverage platform through collaboration with industry and non-dilutive sources of expertise and funding
 - Focus on advancing preclinical portfolio to clinical candidate selection



What are allosteric modulators?



Addex is based on a world leading technology platform



Financials



Financials and Stock

- Cash runway through 2021
 - Cash of CHF43.6M at 30 June 2018
- Traded on SIX Swiss Exchange: ADXN (ISIN:CH0029850754)
- 28,564,031 shares outstanding 37.7M fully diluted)
 - New Enterprise Associated 16%
 - New Leaf Venture Partners 5.6%
 - CAM Capital 5.6%
 - Credit Suisse Asset Management 5.5%
 - Management & board holds 15% (fully diluted basis)
- Analyst coverage:
 - Van Leeuwenhoek Marcel Wijma
 - valuationLAB Bob Pooler
- Market capitalization: approx. CHF60M
- No debt



Upcoming Major Development Milestones

Milestone	Timing
Dipraglurant – LID Phase 3 Registration Program	
Study 301 – start dosing	H2 2019
ADX71441 – Addiction (Partnered with Indivior)	
Phase 1 (NIDA sponsored study) – start dosing	H1 2019



Allosteric modulators for human health www.addextherapeutics.com

