pharmaxis

innovating for life

Investor Briefing

Melbourne; 22nd September

Sydney; 24th September

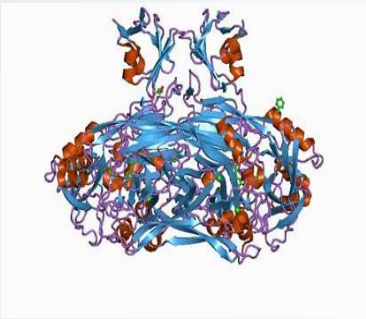
Gary Phillips CEO

Forward looking statement

This document contains forward-looking statements, including statements concerning Pharmaxis' future financial position, plans, and the potential of its products and product candidates, which are based on information and assumptions available to Pharmaxis as of the date of this document. Actual results, performance or achievements could be significantly different from those expressed in, or implied by, these forward-looking statements. These forward-looking statements are not guarantees or predictions of future results, levels of performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this document. Except as required by law we undertake no obligation to update these forward-looking statements as a result of new information, future events or otherwise.

Pharmaxis today

new business focus already creating value



Drug developer

- ❑ Leading position in amine oxidase chemistry and mechanism based inhibitors
- ❑ Proven capability in delivering quality programs to achieve phase 2 ready compounds
- ❑ Exciting pipeline of drug candidates for valuable targets

BD expertise

- ❑ Experienced management team and board
- ❑ Extensive Pharma industry network
- ❑ Proven capability of executing global transactions with major partners

Drug manufacturer

- ❑ Supplies Bronchitol to global markets via experienced commercial partners
- ❑ Financial risks shared
- ❑ Financial upside from accessing new markets – US, Russia
- ❑ Possibility to further rationalise manufacturing infrastructure

Financial strength

- ❑ $54m cash balance at June 2015
- ❑ Significant value milestones from existing partner deals within reach

Pharmaxis product portfolio

Product	Indication	Status	Partner
★ ***LOXL2 inhibitor***	***NASH, Liver & kidney fibrosis***	***Lead optimisation***	***-***
★ ***LOXL2 inhibitor***	***Idiopathic pulmonary fibrosis***	***Lead optimisation***	***Synairgen***
LOX/LOXL2 inhibitor	Fibrosis, cancer	Exploratory	
LOX inhibitor	Cancer, scarring	Exploratory	
★ ***SSAO inhibitor***	***NASH***	***Phase 1***	***Boehringer***
SSAO/MAOB inhibitor	Neuro inflammation; Alzheimer's, MS, etc.	Lead candidate selected	-
SSAO/MPO inhibitor	Respiratory inflammation; Asthma, COPD	Lead optimisation	-
Orbital	Dry powder inhalation device	Phase 1	-
ASM8	Asthma	Phase 2	-
Bronchitol US	Cystic Fibrosis	Phase 3 study underway	*Chiesi*
Bronchitol EU	Cystic Fibrosis	Marketed	*Chiesi*
Bronchitol rest of world	Cystic Fibrosis	Marketed: Australia, CEE Approval pending; Brazil, Russia	*Various*
Aridol	Asthma diagnosis	Marketed: Australia, EU, Korea	*Various*

Pharmaxis drug discovery strategy

Building a biotech powerhouse in fibrosis and inflammation

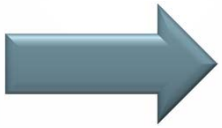
Strategy

Drug discovery:

- ❑ Build a regional biotech powerhouse in fibrosis and inflammation
  - ➢ Multiple drugs from in house amine oxidase chemistry platform
  - ➢ Develop to phase 1 or 2

Partnering:

- ❑ Create value via
  - ➢ Licence out to Big Pharma with attractive 1st in class drugs post phase 1 or 2
  - ➢ Collaborate to de-risk and accelerate PXS programs
  - ➢ Collaborate on in-licensing programs



Achievements to date

Drug discovery:

- ❑ First in class NASH drug taken to phase 1
- ❑ Three further candidates in lead optimisation phase

Partnering:

- ❑ In house BD expertise lands valuable deal with Boehringer Ingelheim - A$39m upfront, total > A$750m
- ❑ Collaboration with Synairgen Research plc for early stage fibrosis program to widen spread of indications, enhance time to value inflection and spread risk

Valuing the Pharmaxis pipeline

Building a biotech powerhouse in fibrosis and inflammation

Opportunities

- Milestone payments from Boehringer as PXS4728A progresses in NASH
  - next: start of phase 2 ~end 2016
- Synairgen LOXL2 collaboration in pulmonary fibrosis to phase 1 or 2 and subsequent partnering
  - next: commencement of formal preclinical program ~ beginning 2016
- Pharmaxis LOXL2 program for NASH and other fibrotic diseases at lead optimisation stage
  - next: commencement of formal preclinical program ~beginning 2016

Speakers

- Professor Jacob George,
  University of Sydney, Westmead Hospital
  - NAS epidemiology, diagnosis and morbidity
  - New treatments
  - Rationale for SSAO and LOXL2.
- Wolfgang Jarolimek,
  Head of Drug Discovery, Pharmaxis
  - The Pharmaxis drug discovery process
  - SSAO inhibitor – new data
  - Status of Pharmaxis' LOXL2 programs.
- Simon Buckingham,
  Non-Executive Director, Pharmaxis
  - Insights on transacting with big pharma
  - Biotech anti-fibrotic deal values
  - Inside the Boehringer Ingelheim deal

Clinical perspective

Unmet needs in fatty liver disease (NASH)

Jacob George

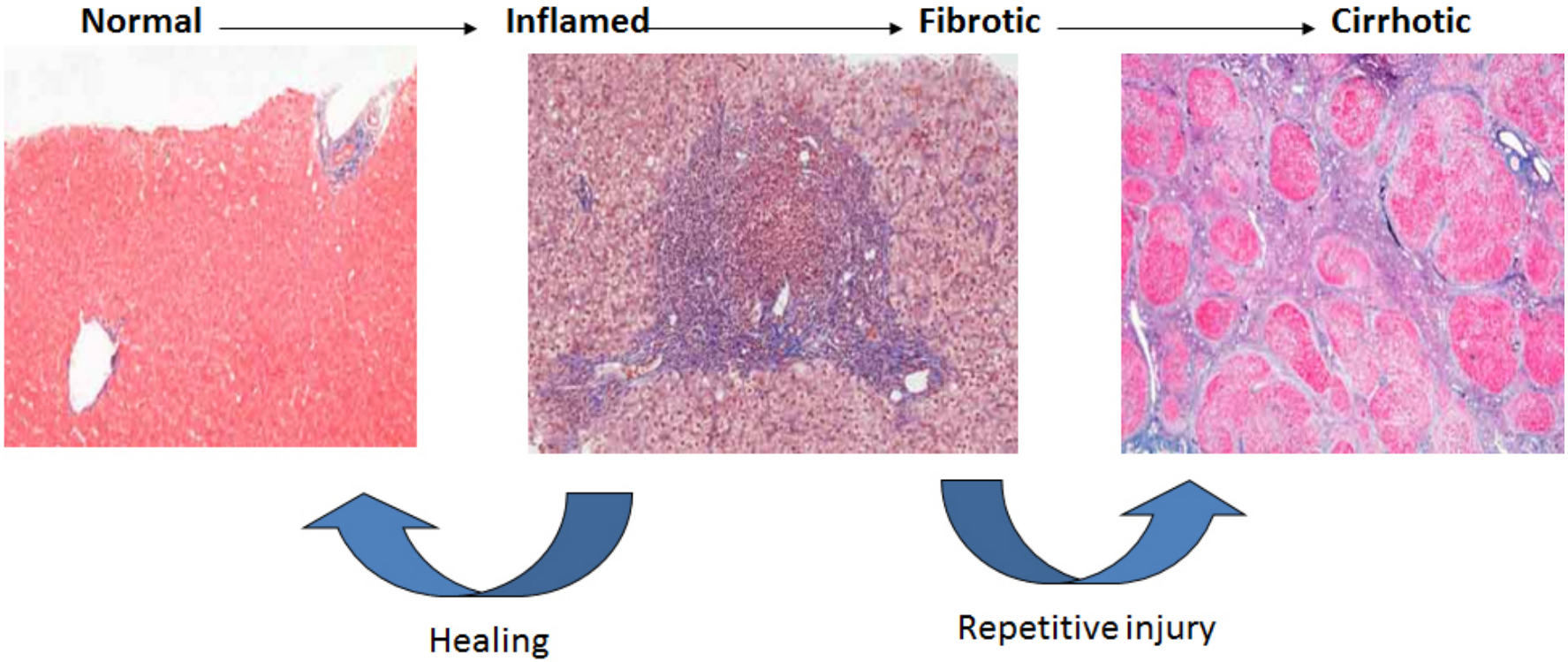
STORR LIVER CENTRE

Westmead Millennium Institute for Medical Research

THE UNIVERSITY OF SYDNEY

Why do we treat liver diseases

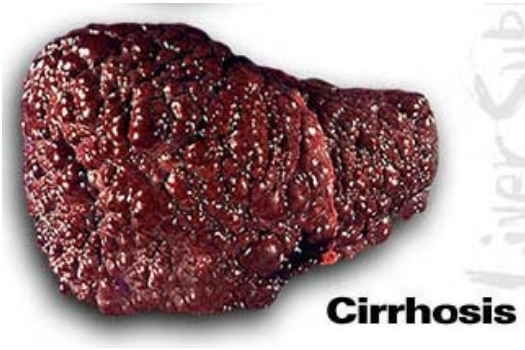
Progression of fibrosis

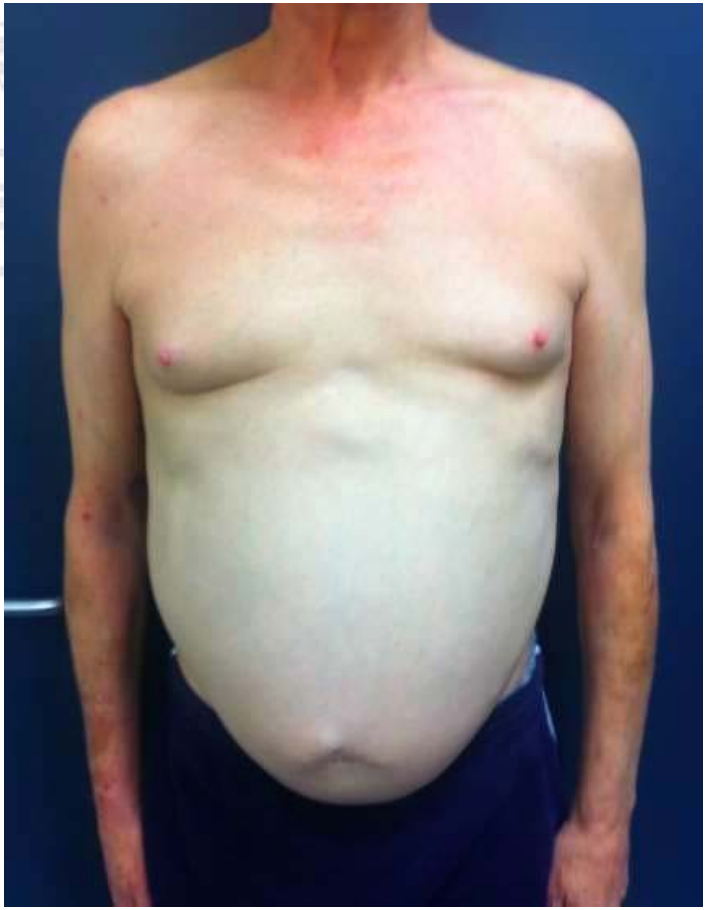


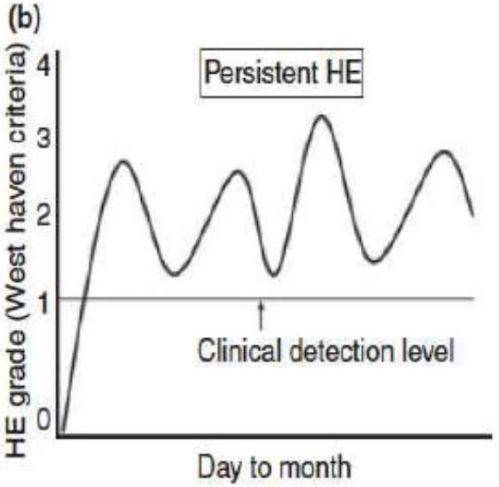
May be reversible process with treatment of underlying disease

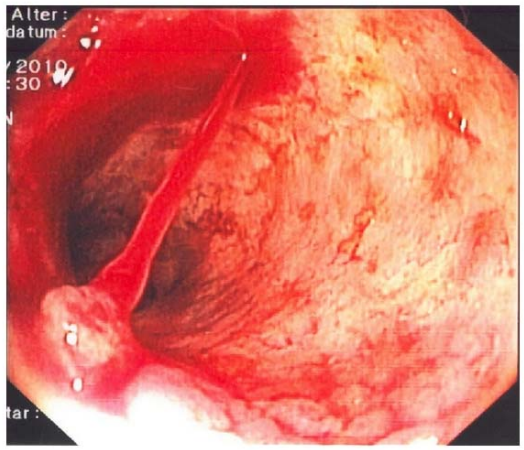
Extensive fibrosis and formation of repetitive nodules

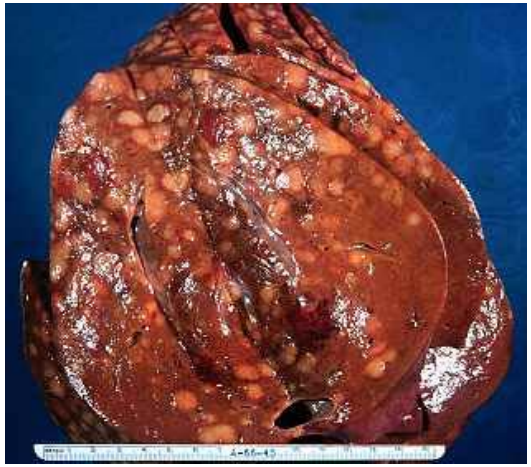
Cirrhosis is not good







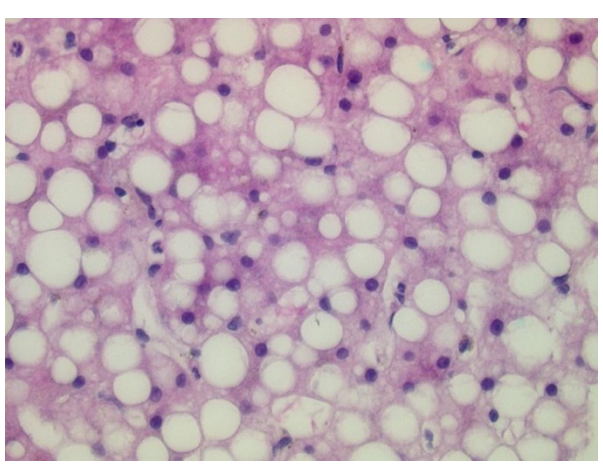
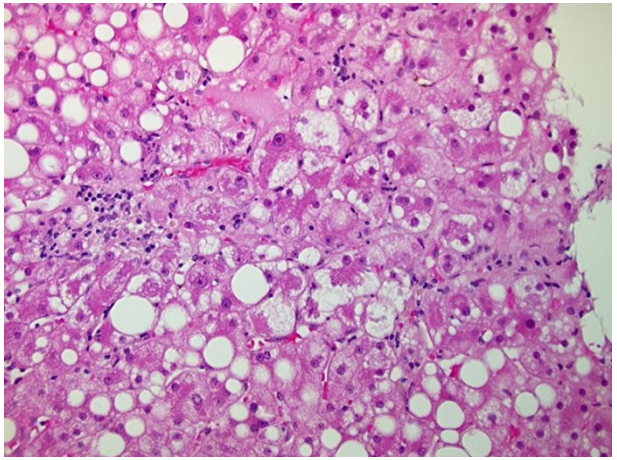
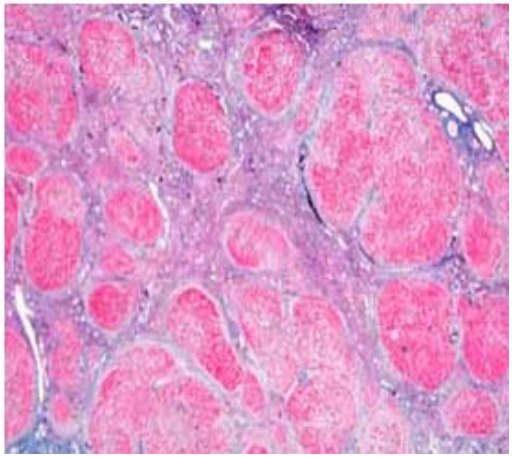




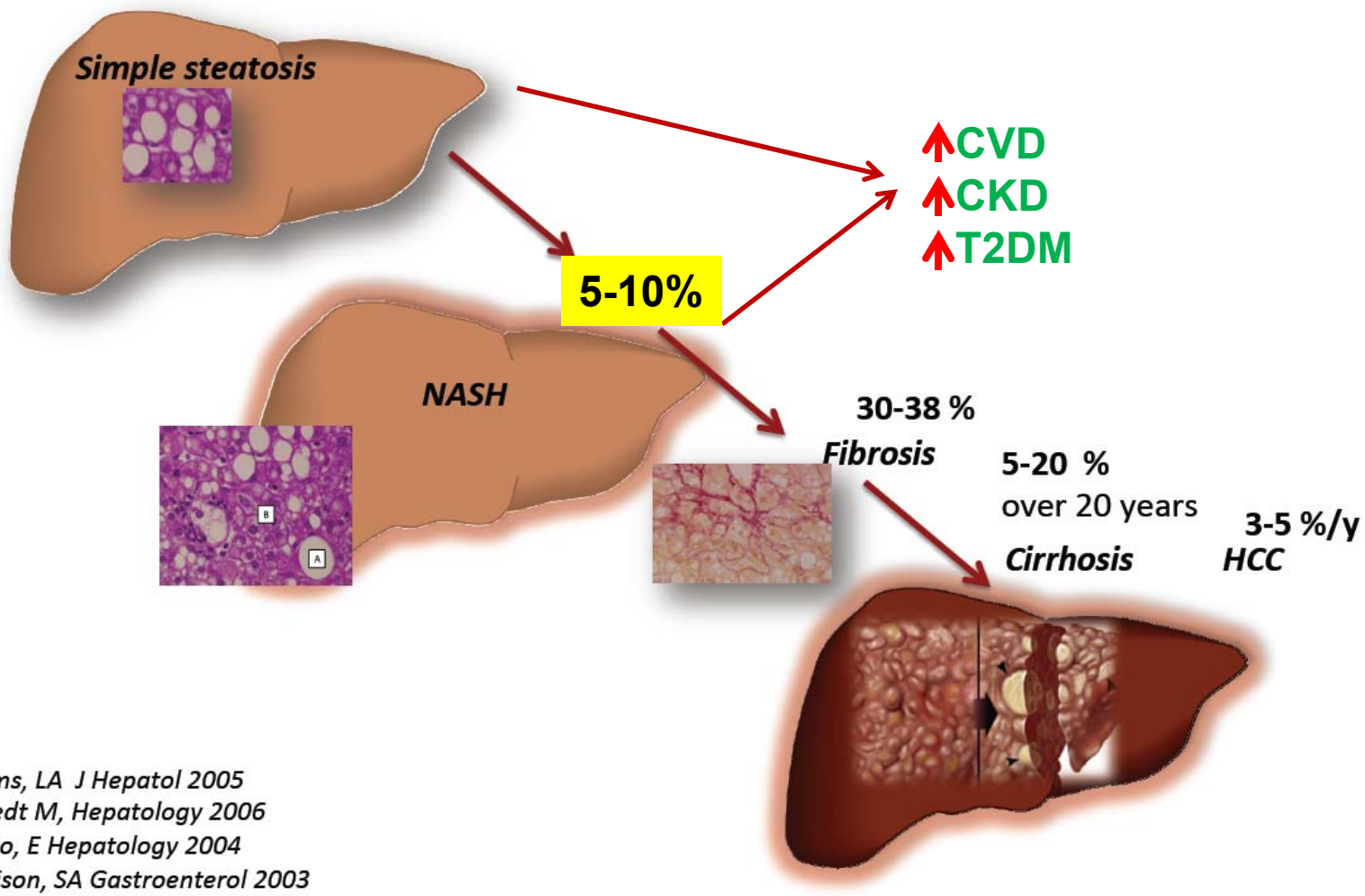
What is NAFLD?

NAFLD

- **A spectrum of disorders characterized by predominantly steatosis (liver fat)**
- **In practice**
  - **Can worsen any liver disease (including alcohol)**

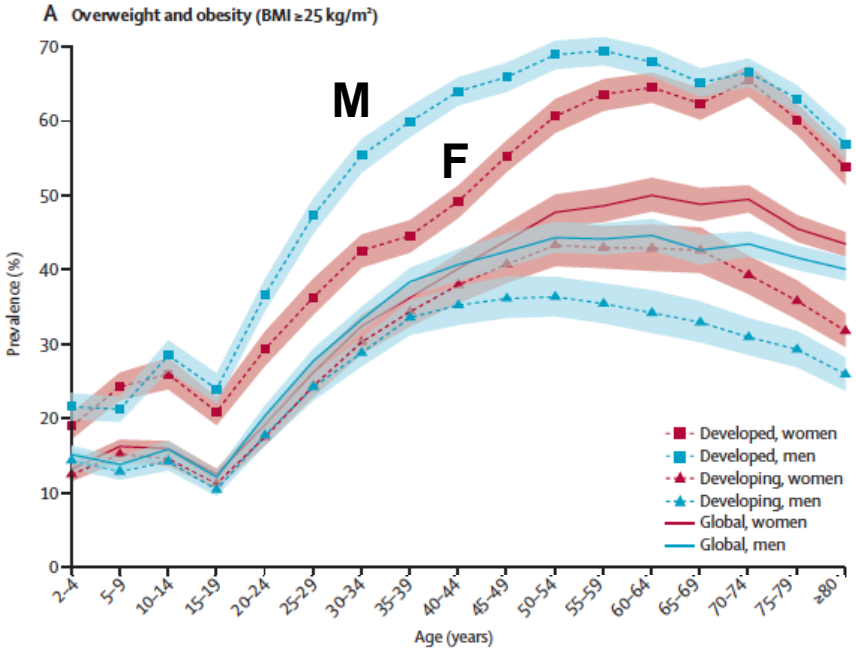
The spectrum of NAFLD

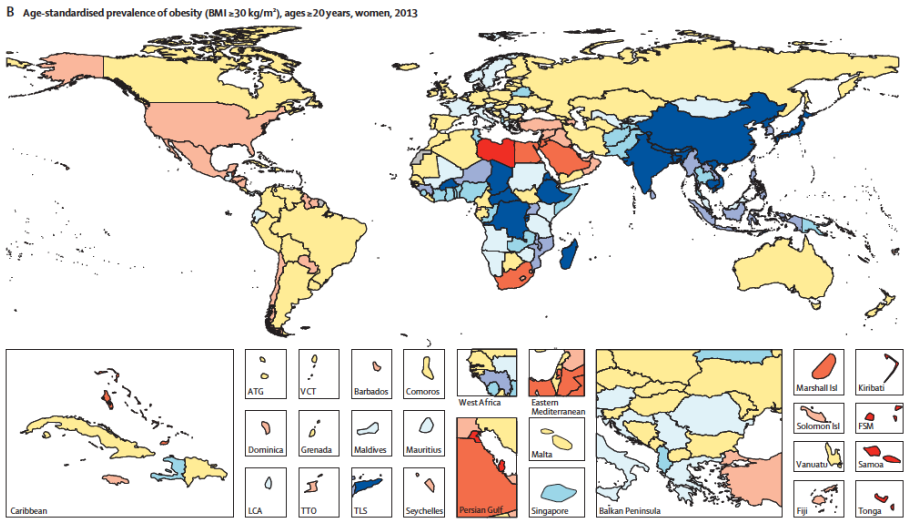


Adams, LA J Hepatol 2005
Ekstedt M, Hepatology 2006
Fassio, E Hepatology 2004
Harrison, SA Gastroenterol 2003

Why does NASH occur?

Global prevalence of Overweight/obesity



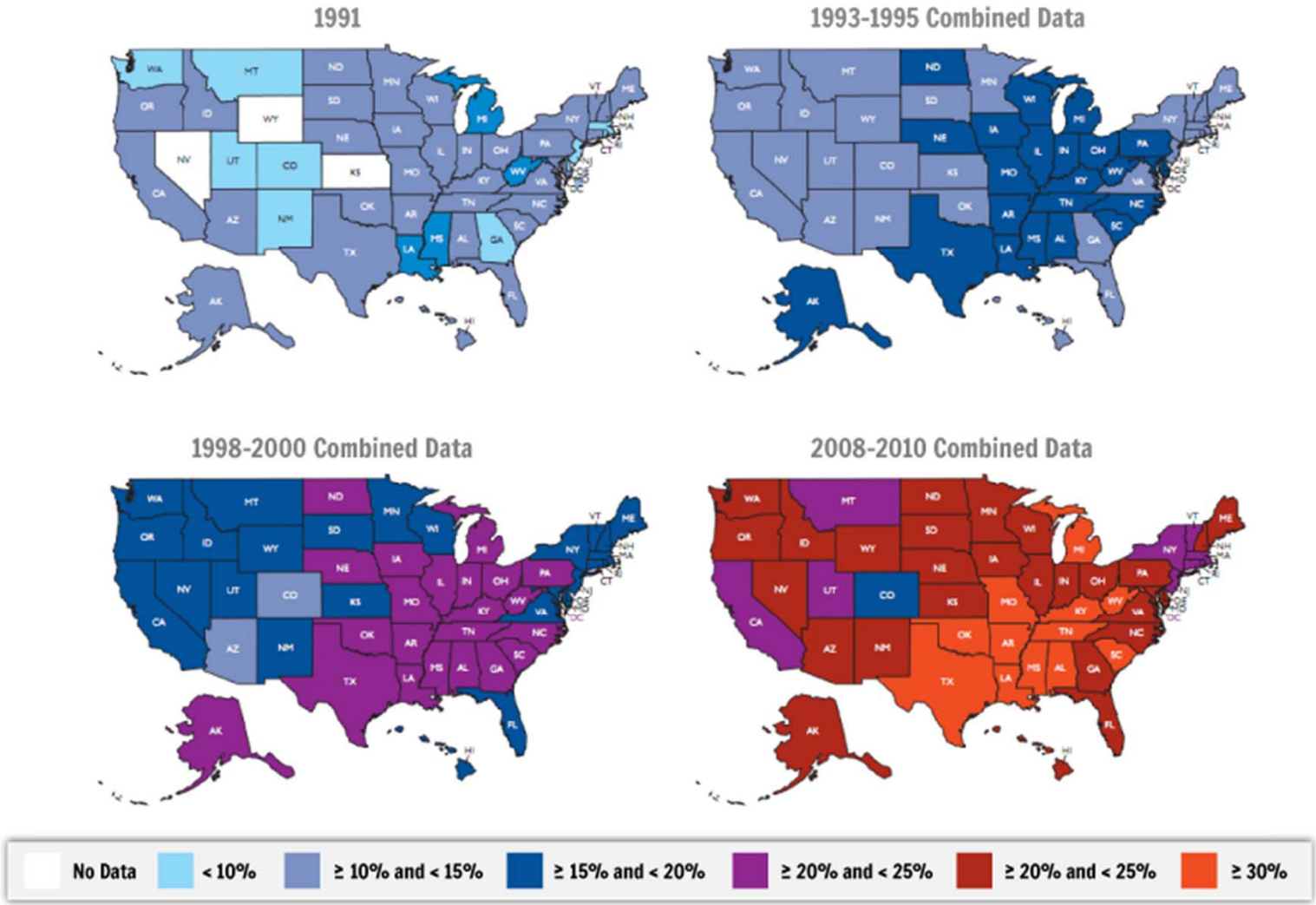


- 3.4 m deaths; 3.9% of years of life lost, 3.8% of DALYs; 1769 reports
- Global prevalence 1980-2013: 29% in men to 37%; Women 30% to 38%; 47% increase in children
- >50% in women from Kuwait, Kiribati, Micronesia, Libya, Qatar, Tonga, Samoa

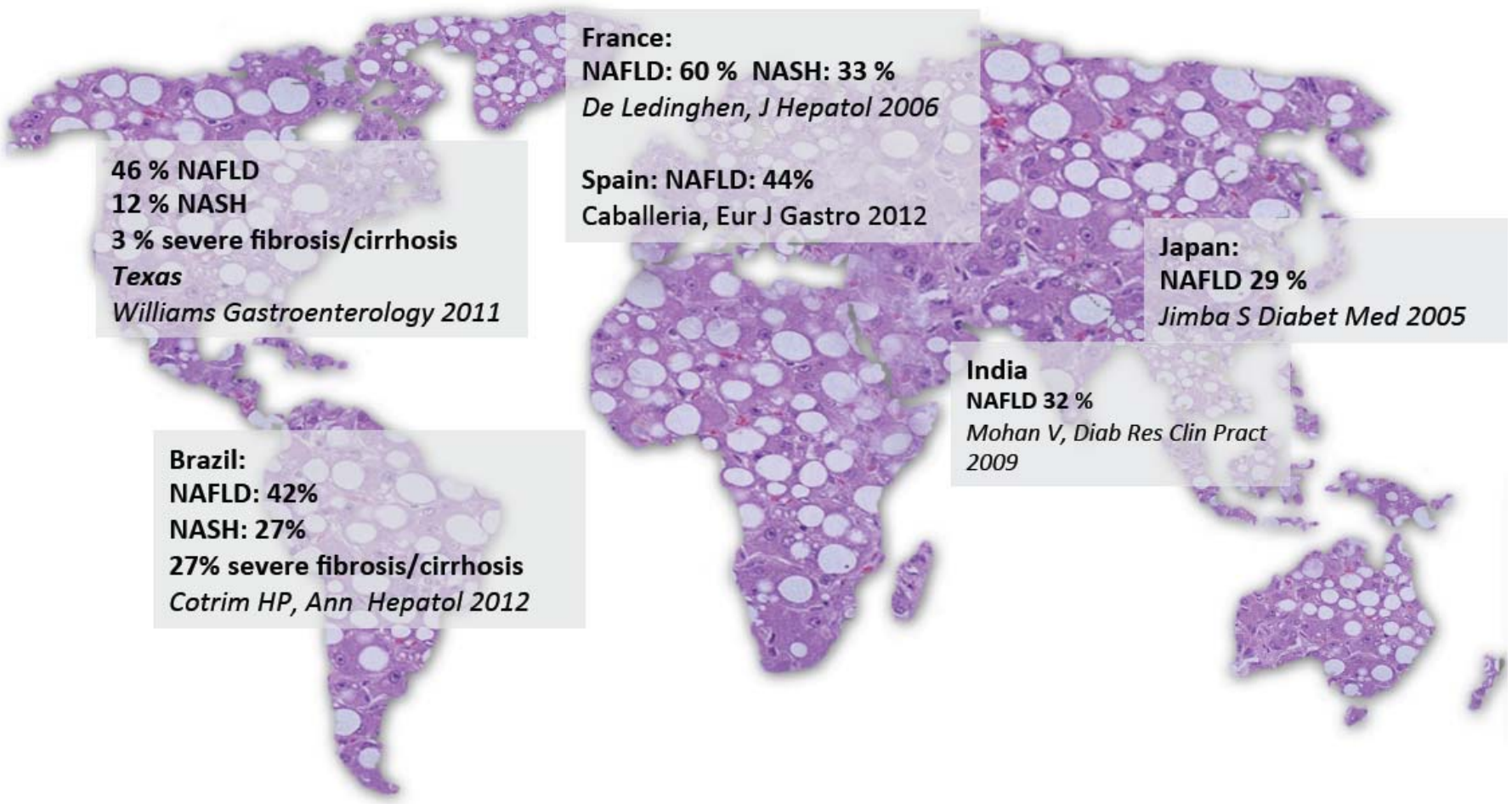
Lancet 2014; 384: 766–81

The problem of obesity: US Data from CDC

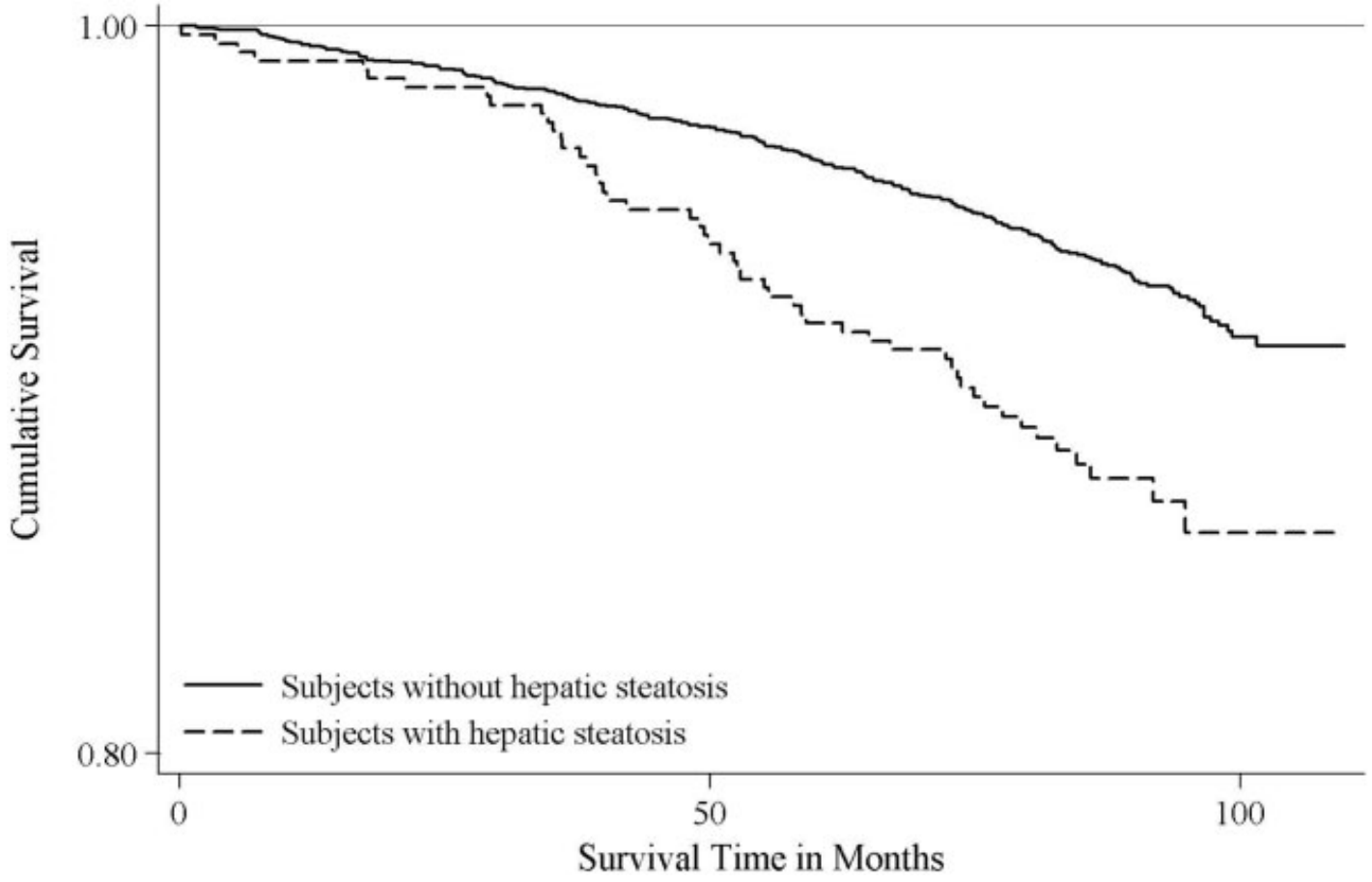
Rate of obese adults by US State (BMI ≥30)



GLOBAL EPIDEMIOLOGY OF NAFLD/NASH

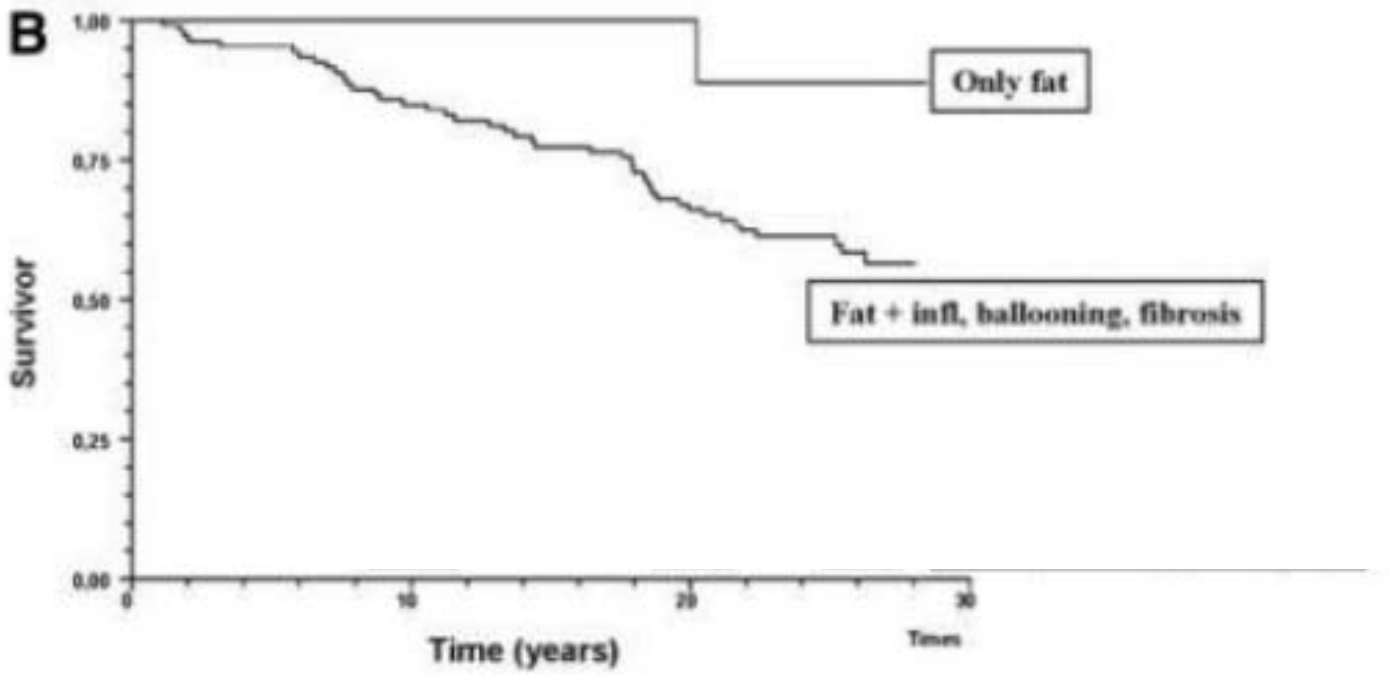


Survival: Study of Health in Pomerania (N= 4160)



Haring, Hepatology 2009

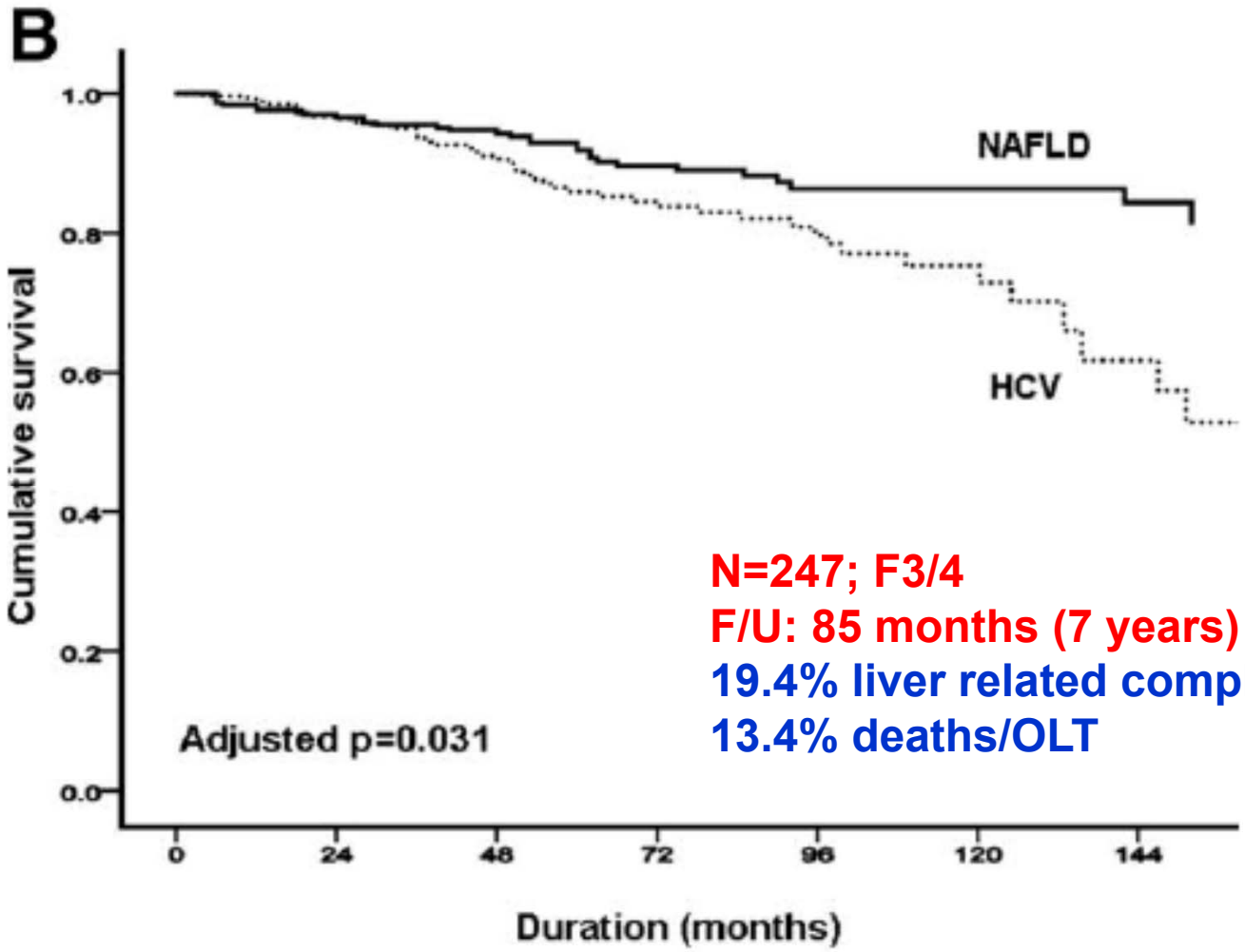
Life expectancy in NAFLD



Overall survival of subjects in the study with NASH or bland steatosis.
n=256; median follow up 24 years

Soderberg et al. Hepatology 2010

NASH Cirrhosis: Poor outcomes



N=247; F3/4
F/U: 85 months (7 years)
19.4% liver related complications (2.8% pa)
13.4% deaths/OLT

Bhala et al. Hepatology;2011:epub

A Clinically Silent Disease

- **Symptoms:**

– None 20 - 77%

– Right upper quadrant pain 25 - 48%

– Fatigue 50 - 75% (Obstructive sleep apnea in 40%)

- **Signs:**

– Overweight/Obese 85 - 95%

– Acanthosis nigricans 10 -15%

– Hepatomegaly 25 - 50%

- **Laboratory :**

– ALT, AST - modest elevation

– "Normal enzymes" (up to 80% of NAFLD)

- **Radiological:**

- Ultrasound: echogenic parenchyma; beam attenuation

Diagnosis

Liver ultrasound

Liver tests

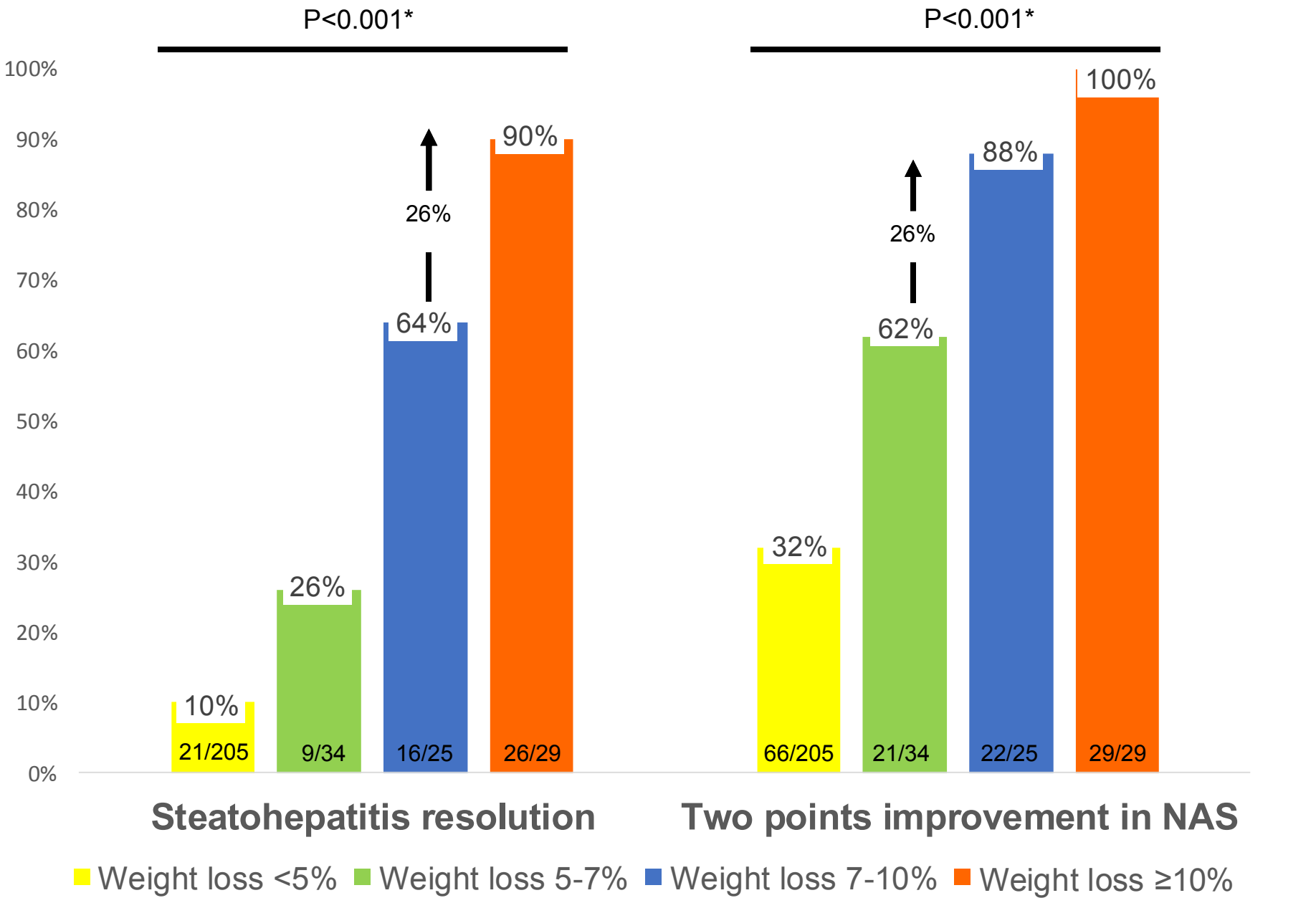
Fibroscan

Liver biopsy

Principals of treatment

- **Reduce liver fat aka IR aka obesity**
  - **Lifestyle intervention**
  - **Bariatric surgery**
- **Reduce liver inflammation**
- **Reduce liver fibrosis**

Current treatment



**Mantel-Haenszel X^2 test for trend*

In press, Gastroenterology (2015), doi: 10.1053/j.gastro.2015.04.005.

So the problem is:

- **Big!!!!**
- Obesity associated NCD exceeds infectious disease as commonest global cause of death
- Can only be managed (not prevented), unless we can change
  - Behaviour –Diet, exercise, PA

Potential treatments

- PPARg agonists (anti-diabetic agents)
- Incretins, Glut2-I
- Vitamin E
- FXR agonists
  - Intercept, Gilead
- PPAR alpha-delta antagonists
  - Genefit

Treatment trials for NASH

Company	Drug	MoA	RoA	Phase
Raptor	**RP103**	Antioxidant - cysteine depleting agent	Oral	Phase 3
Zydus-Cadila	Saroglitazar	PPAR agonist (α,γ)	Oral	Phase 3
Novo Nordisk	**liraglutide**	GLP-1	SubQ	Phase 2
Takeda	**Pioglitazone**	PPAR agonist	Oral	Phase 2
Islet Sciences	remogliflozin etabonate	SGLT-2 inhibitor	Oral	Phase 2
Aptalis Pharma	Ursodeoxycholic acid	Bile acid	Undefined	Phase 2
Gilead	**Simtuzumab**	LOXL2 antibody	IV and SubQ	Phase 2
Conatus	**Emricasan**	Caspase protease inhibitor	Oral	Phase 2
Galmed	**Aramchol**	Synthetic fatty acid/ bile acid conj	Oral	Phase 2
Tobira	**Cenicriviroc**	Dual CCR2/CC5 antagonist	Oral	Phase 2
Genfit	**GFT 505**	PPAR alpha/delta agonist	Oral	Phase 2
Intercept	**OCA**	FXR agonist	Oral	Phase 2
Phenex	**PX 104**	FXR agonist (non bile acid)	Oral	Phase 2
Mochida	icosapent ethyl ester	Caspase protease inhibitor	Oral	Phase 2
Immuron	IMM 124E	Immunomodulators	Oral	Phase 2
KT&G Life Sciences	MB 12066	Sirtuin stimulants	Oral	Phase 2

Adis R&D Insight, Thomson Reuters Cortellis

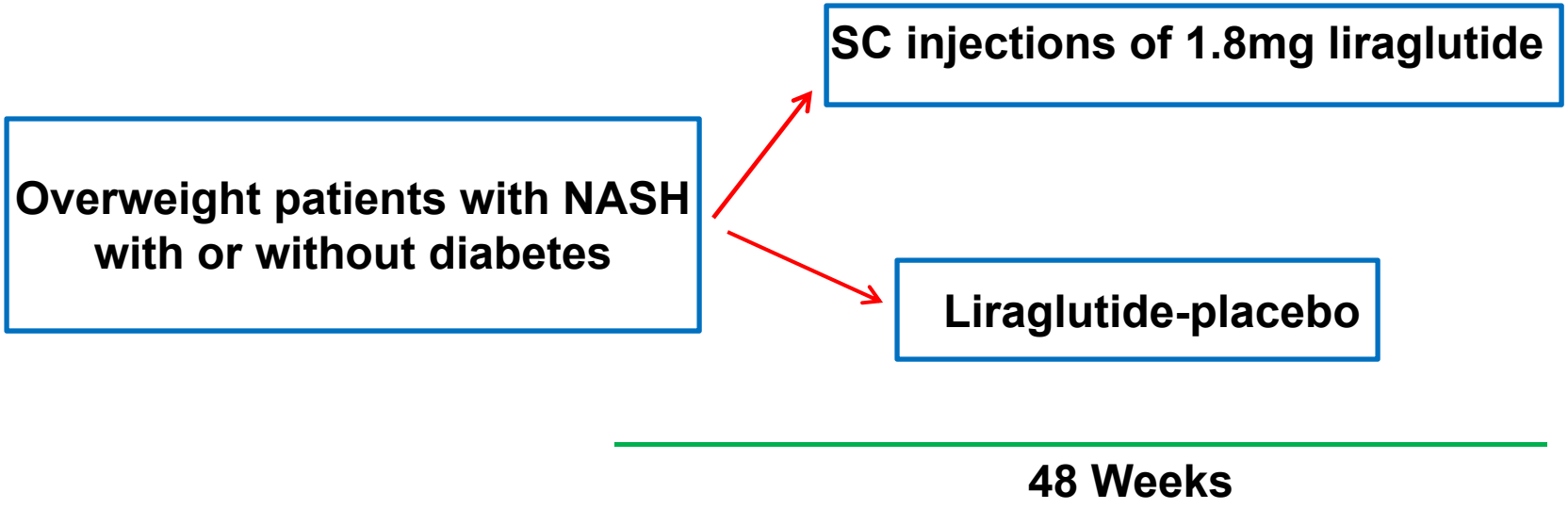
Treatment Trials for NASH

Company	Drug	MoA	RoA	Phase
PharmaKing	Oltipraz	Fatty acid inhibitor	Oral	Phase 2
Novartis	Pradigastat	DGAT1 inhibitor	Oral	Phase 2
Therapix	TRX 318	CD3 antigen	Oral	Phase 2
Takeda	**Roflumilast**	PDE-4	Oral	Phase 2
Antipodean	Mitoquinone	Antioxidant	Oral	Phase 2
KT&G Life Sciences	MB 11055	AMPK stimulant	Undefined	Phase 2
Naia	NC 101	Undefined mechanism	Undefined	Phase 2
Galectin	**GR MD 02**	Galectin-3	IV and SubQ	Phase 1
Kadmon	KD 025	ROCK2 inhibitor	Oral	Phase 1
Phenex	PX 102	FXR agonist	Oral	Phase 1
Shire	SHP 626	ASBT inhibitor	Oral	Phase 1
Durect	DUR-928	Undefined small molecule	Oral	Phase 1
Daewoong	DWP-10292	Undefined small molecule	Oral	Phase 1
Gilead	GS-4997	ASK1 inhibitor	Oral	Phase 1
TaiwanJ	JKB-121	TLR-4 antagonist	Oral	Phase 1
Madrigal	MGL-3196	THR beta agonist	Oral	Phase 1
Virobay	VBY-376	Cathepsin B inhibitor	Oral	Phase 1
La Jolla	LGPC-1010	Galectin-3	Oral	Preclinical

Incretin-based therapies (Liraglutide)

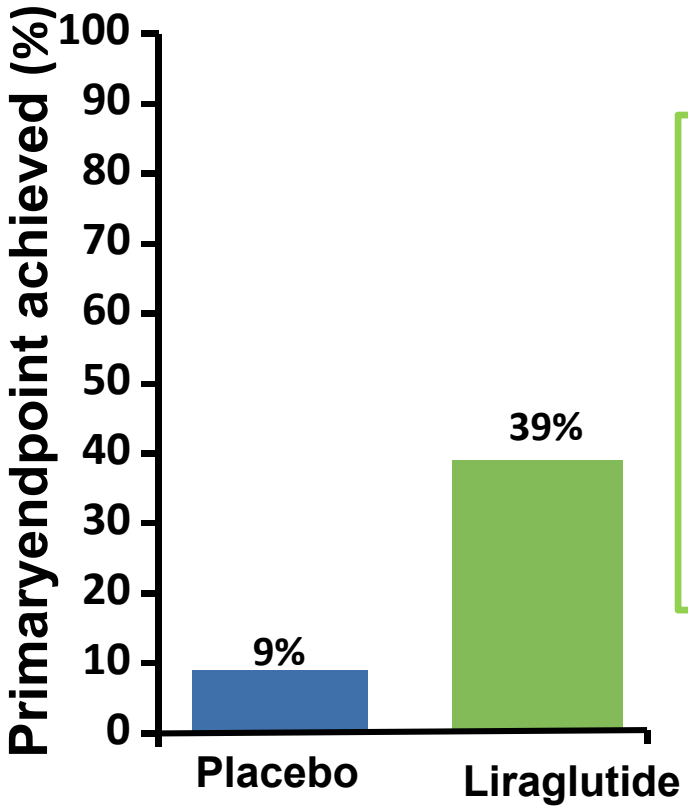
The LEAN Study:

- Multicentre, 26 Liraglutide, 26 placebo
- Double-blinded, randomised, placebo-controlled phase II trial.
- Primary endpoint: Resolution of definite NASH and no worsening F



Armstrong MJ, EASL 2015

Liraglutide and NASH

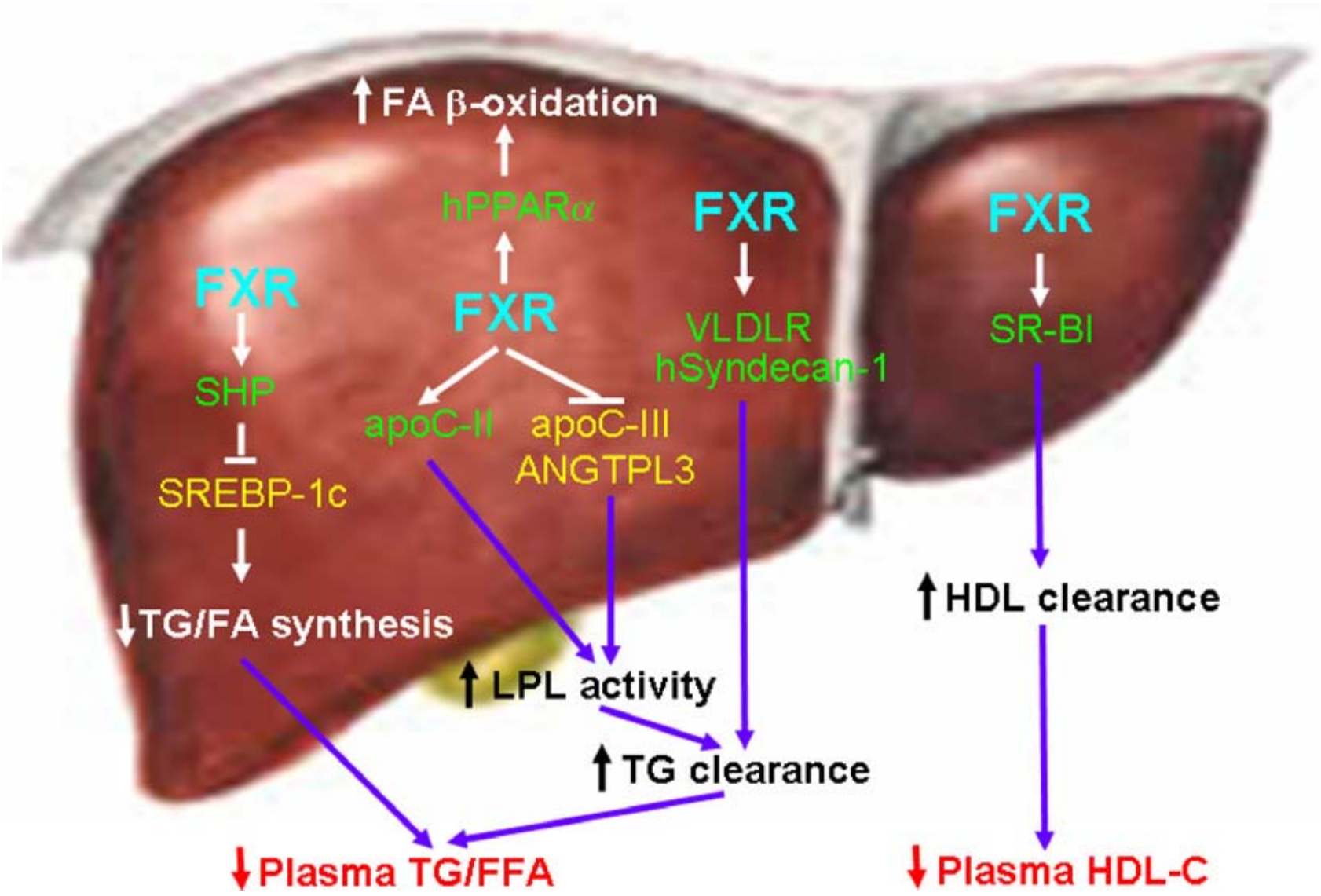


✓As expected with liraglutide, improvements were also seen in BMI and fasting glucose levels.

✓No treatment related side effects

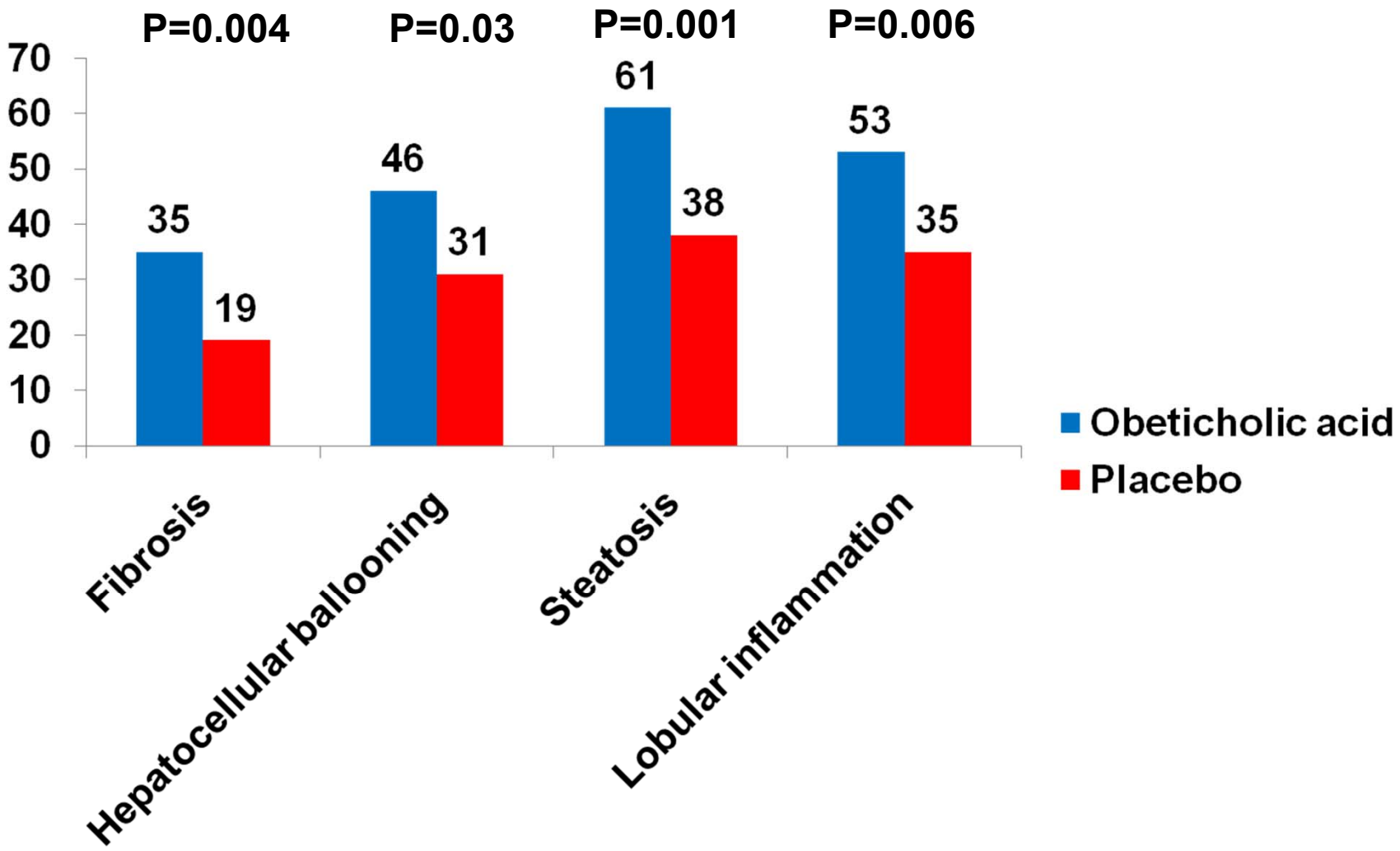
Armstrong MJ, EASL 2015

FXR effects on lipid metabolism



Zhang & Edwards, FEBS Lett. 582:10, 2008

Changes in histological features of the liver after 72 weeks of Obeticholic acid treatment



Neuschwander-Tetri BA,, et al. Lancet. 2015;385(9972):956-65

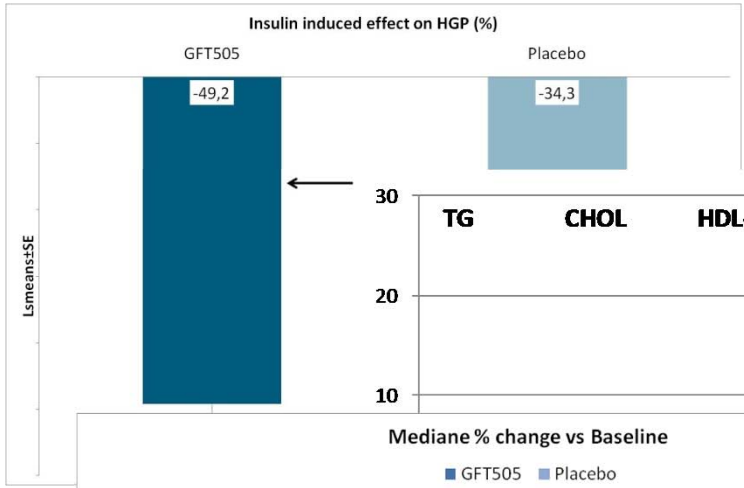
Systemic FXR agonists have issues!

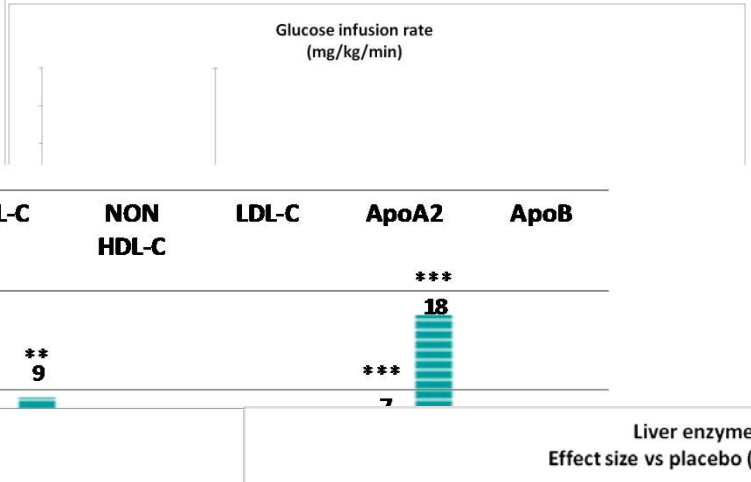
- FLINT Study:
  - Increased LDL, decreased HDL
  - Increased hepatic insulin resistance
  - Pruritus
- The first two problems are likely due to FXR activation in liver
- Pruritus due to Obeticholic Acid being a bile acid

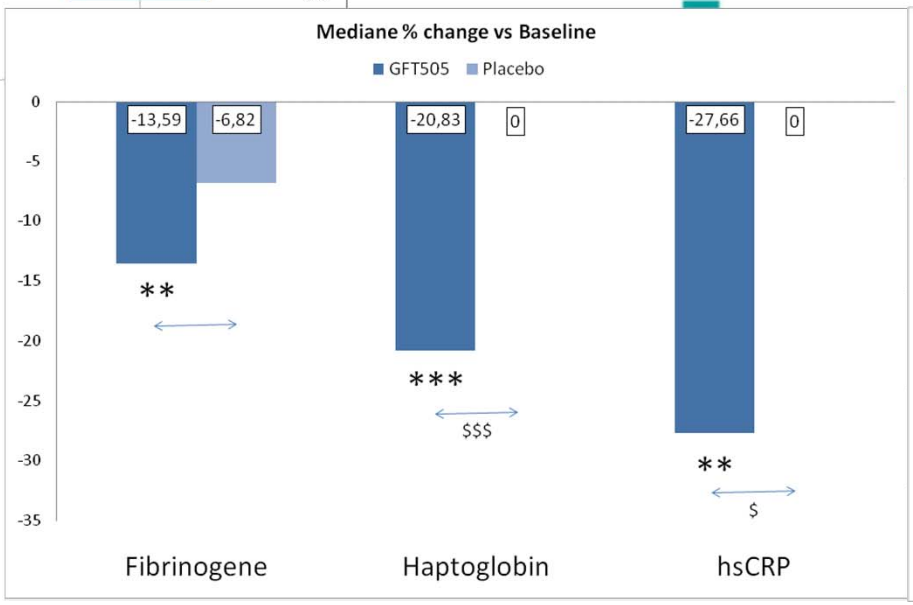
GFT505, New dual PPARα/δ–non PPARγ compound

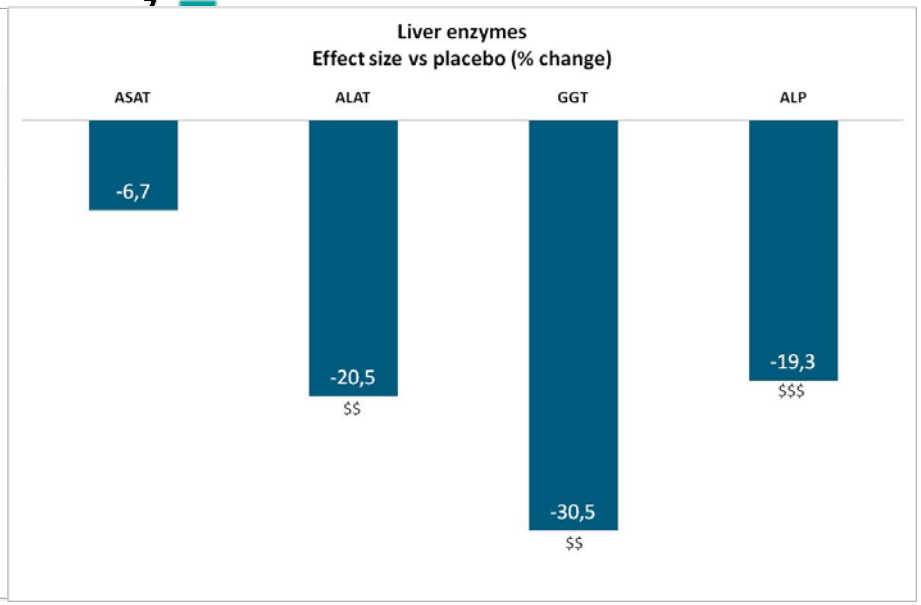
- GFT 1007 main active circulating metabolite
- **PPAR α activity** (15 nmol vs 30µmol fenofibrate); **PPAR δ activity** (75 nmol vs 1 nmol GW501516)
- Extensive enterohepatic cycling and liver targeted
- No induction of PPAR α or δ genes in muscle
- No PPAR γ activity (no adiponectin induction)

GFT505, Metabolic effects in abdominally obese and prediabetic







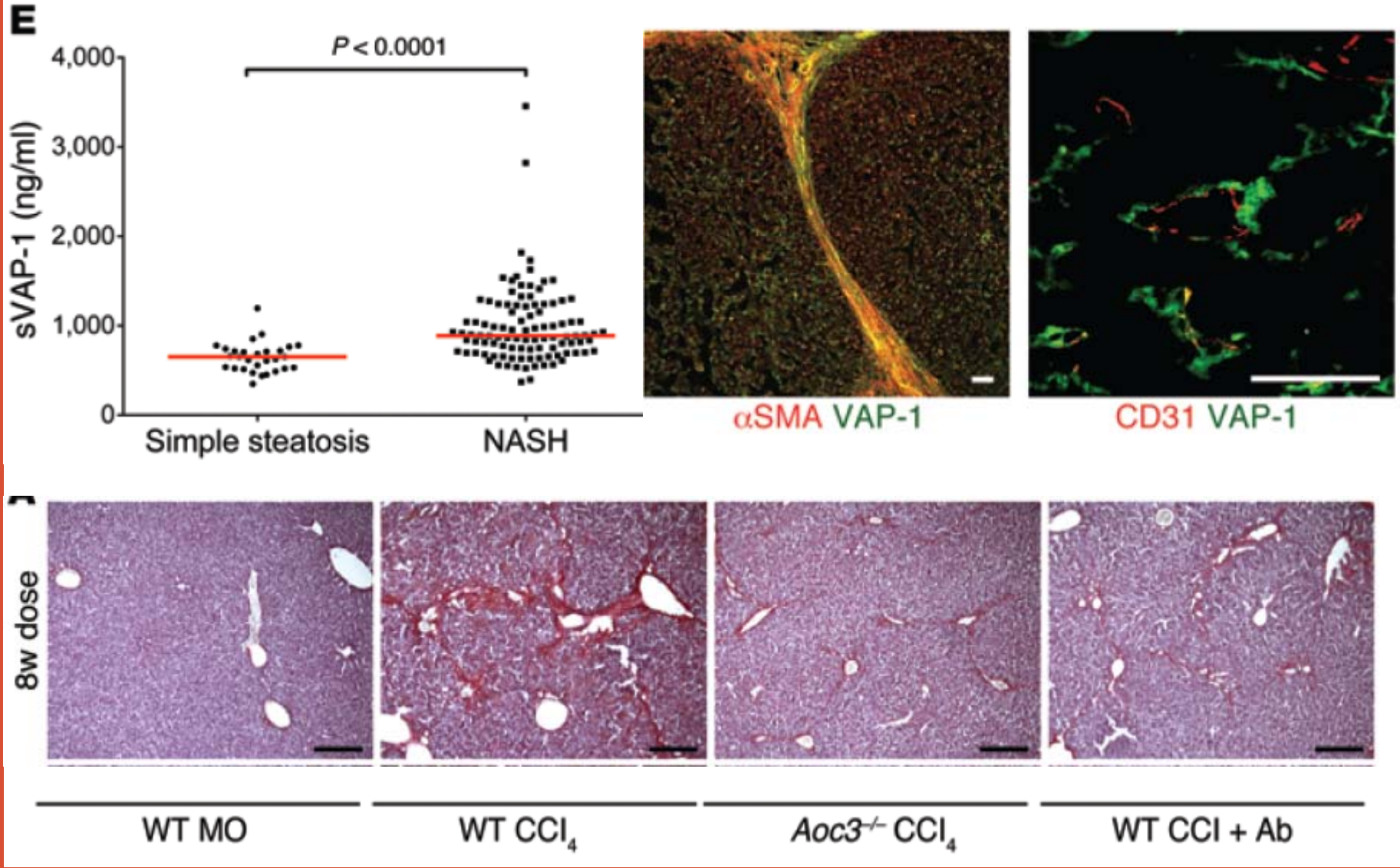


Cariou, Diabetes Care 2011
Cariou, Diabetes Care 2013

Targeting inflammation

- Vascular adhesion protein-1 (VAP-1)
  - Semicarbazide-sensitive amine oxidase (SSAO)
  - Promotes white cells entering injured tissues
  - Promotes inflammation
  - Promotes oxidate stress

Targeting inflammation

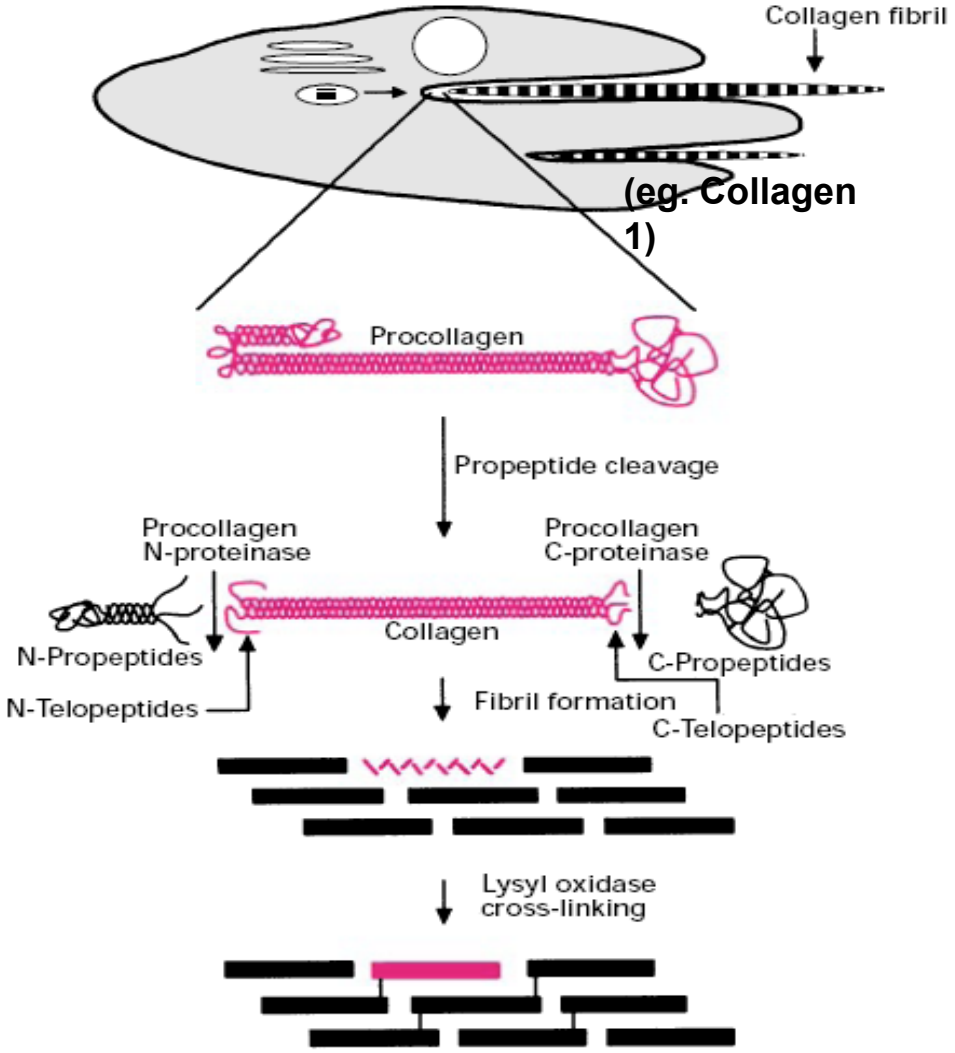


Weston et al JCI 2014

Targeting fibrosis
Lysyl Oxidase-Like 2: LOXL2

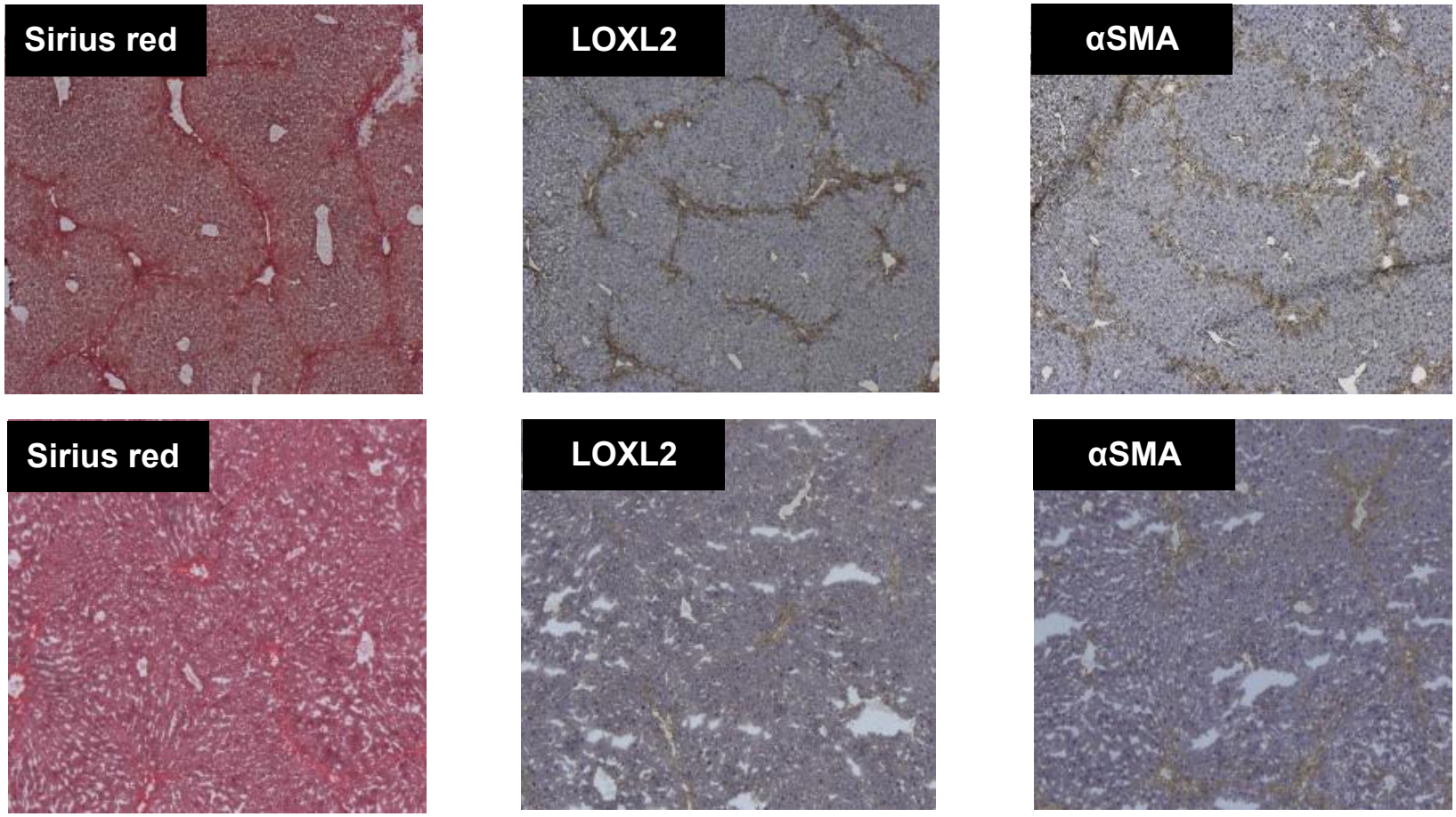
SIMTUZUMAB

- Humanized monoclonal antibody that binds LOXL2
- Half life of ~10-20 days when dosed iv
- SC dose is well tolerated
- Safe and well tolerated in > 300 subjects some for >1 year of exposure
- To date has been dosed safely in 57 patients with liver fibrosis



Courtesy J Bornstein, Gilead

Reduction of Fibrosis and Myofibroblasts



- AB0023 administered concurrently with CCL4, Balb/C mice
- Significant reduction of bridging fibrosis with AB0023 (F1 rather than F3)
- Reduction of myofibroblasts, LOXL2 in porto-portal bridges

Courtesy J Bornstein, Gilead

Barry-Hamilton, Nat Med 2008

Summary

- NAFLD/NASH are common
- Major cause of liver disease burden
- Significant cause of liver cancer
- Currently an unmet therapeutic need
- **Target:** fat, inflammation, fibrosis
- Major area for therapeutic drug discovery


Thank you !

pharmaxis

innovating for life

Drug Discovery @ Pharmaxis

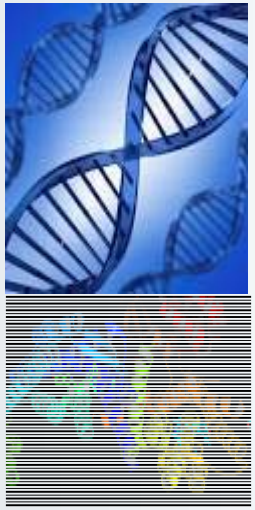
Melbourne; 22nd September

Sydney; 24th September

Wolfgang Jarolimek, PhD
Head Drug Discovery

Drug Discovery and Development

Target validation

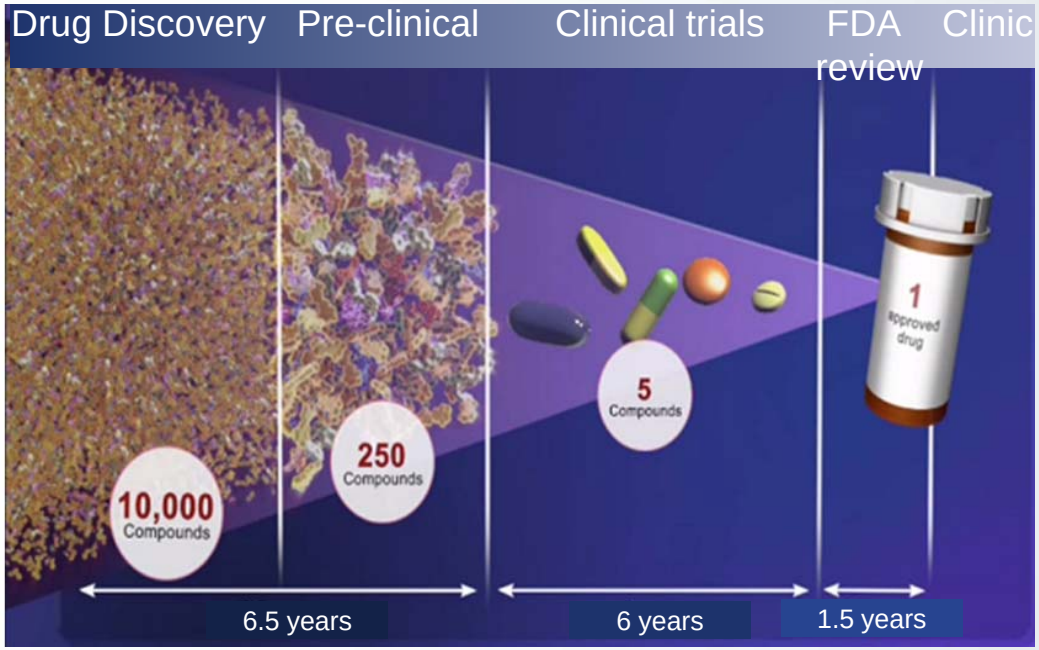


?? years

HTS screening

>1 million Compounds

6 months – 3 years



http://www.ncats.nih.gov/

The standard process

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Drug Discovery and Development

strategy to improve chances of success

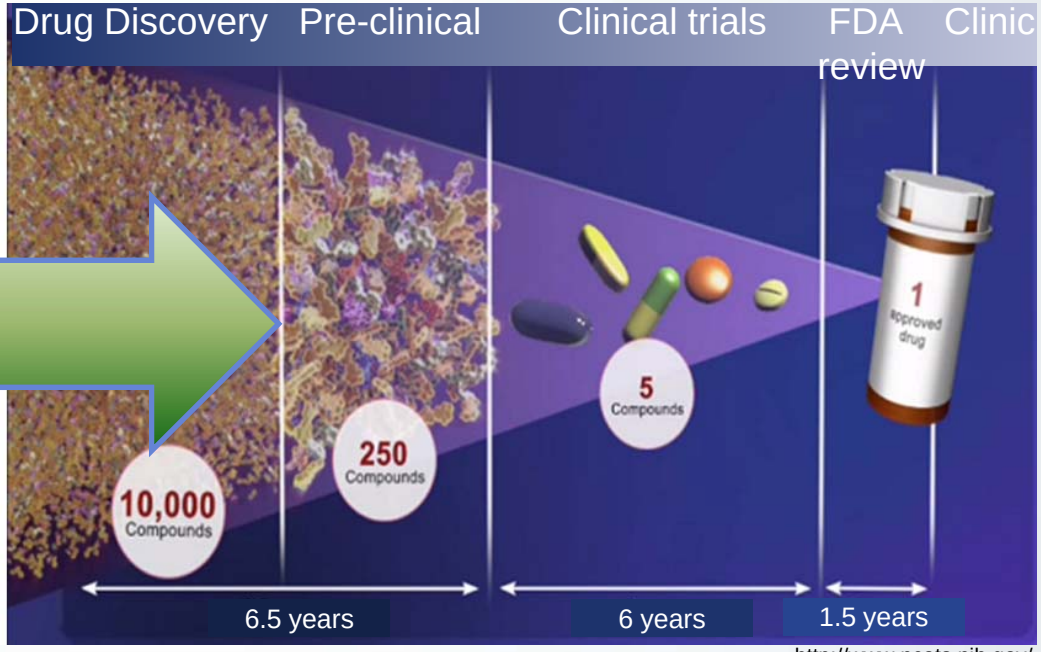
Pharmaxis strategy:

Validated targets
- Compelling pre-clinical evidence
- Clear role in human disease

Tractable chemical starting points
- small molecules with good properties
- clinically proven mechanisms

High success in translation to human trials
- predictive pharmacokinetics
- plasma biomarker

Accelerated clinical development
- all relevant expertise at Pharmaxis
- Phase 1 run in Australia



http://www.ncats.nih.gov/

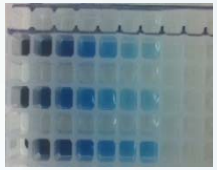
Compound progression

@ Pharmaxis
and Contract Research Organisations (CRO)

@ CRO
and Pharmaxis

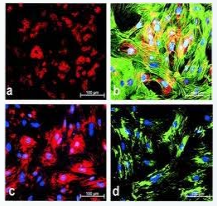
Synthesis of compounds

Enzymatic assays



Cellular assays

***In vitro* and *in vivo* Pharmacokinetic assays**



Disease model

Scale up

Toxicity

Phase 1

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Compound progression

Lead optimisation
1-3 years

Pre-clinical development
1.5-2 years

Phase 1
8 months

Synthesis of compounds

Enzymatic assays

Cellular assays

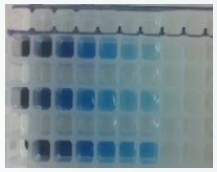
***In vitro* and *in vivo* Pharmacokinetic assays**

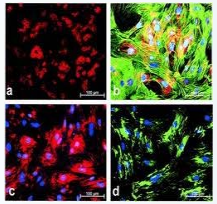
Disease model

Scale up

Toxicity

Phase 1





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Phase 1 Clinical trial: PXS-4728A
(Boehringer partnered drug)

Single ascending dose and multiple ascending dose placebo-controlled double-blind phase 1 study of PXS-4728A administered orally in healthy adult males (PXS-4728A-101)

Primary objective:

To evaluate the safety and tolerability of single ascending or repeated oral doses of PXS-4728A.

- Recording of adverse events throughout the study.
- Change from baseline in:
  - Electrocardiogram (ECG) readings
  - Clinical monitoring of blood pressure (BP)
  - Heart rate (HR)
  - Laboratory assessments

Phase 1 Clinical trial: PXS-4728A
(Boehringer partnered drug)

Secondary objectives:

To evaluate plasma pharmacokinetic parameters after single and repeat oral dosing of PXS-4728A:

- AUC $_{(0\text{-}t)}$ and AUC $_{(0\text{-}inf)}$
- C_{max} – maximum concentration
- T_{max} – time to maximum observed plasma drug concentration
- $t_{1/2}$ – Terminal half-life
- Accumulation ratio (For Part B only)

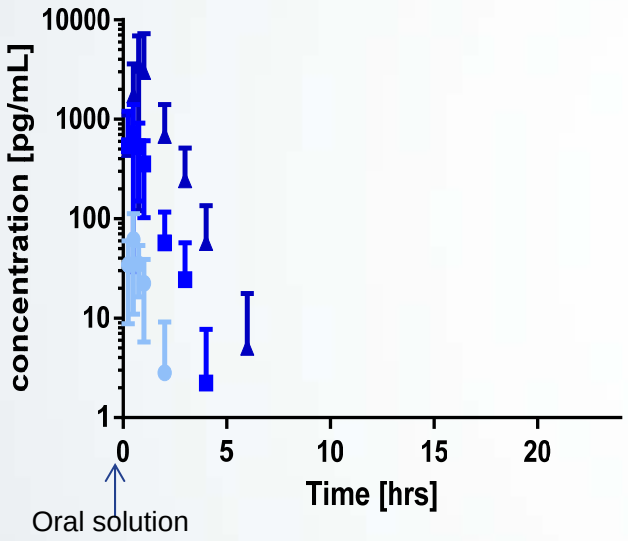
Assessment of plasma pharmacodynamic parameters after single and repeat dosing of PXS-4728A:

- SSAO activity in plasma using enzymatic assay
- SSAO concentration in plasma using ELISA method

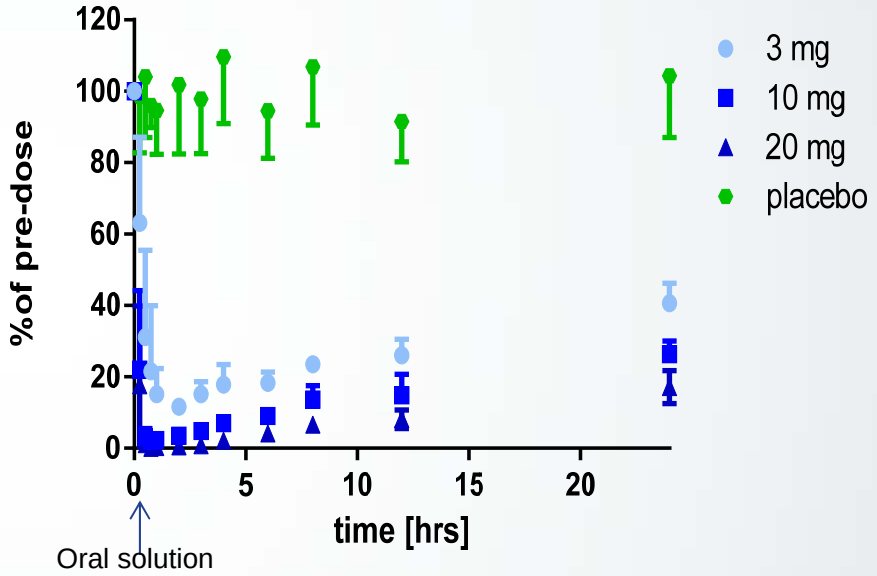
Phase 1 Clinical trial: PXS-4728A

Single ascending dose trial

PXS-4728A plasma concentration



SSAO activity in plasma



- Fast uptake <1hr to peak
- Linear dose-dependent increase in plasma concentration
- Fast elimination $t_{1/2}$ <2 hrs

- Fast inhibition
- Dose-dependent decrease in enzymatic activity
- Long-lasting inhibition >1day

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Phase 1 Clinical trial: PXS-4728A

Outcomes (Single and repeated dose trials):

PXS-4728A successfully completed the Phase 1 study

- Well tolerated, no safety signals in single or repeated dosing
- High oral bioavailability from simple formulation
- Pharmacokinetic properties show expected brief exposure
- Enzyme activity is inhibited > 24 hrs by a single daily dose <10mg
- SSAO/VAP-1 (AOC3 gene): a biomarker for diseases and efficacy of PXS-4728A

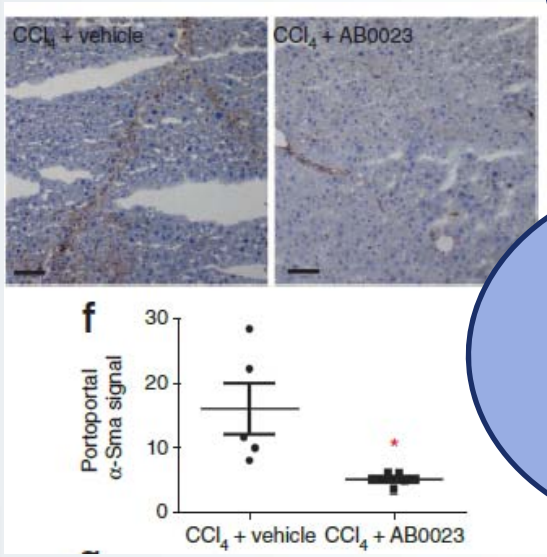
PXS-4728A fulfilled all pre-clinical expectations

Boehringer Ingelheim proceeds with the clinical development

Joint presentation at international congress in 2016

LOXL2 and/or LOX and fibrosis

Allosteric inhibition of lysyl oxidase–like-2 impedes the development of a pathologic microenvironment



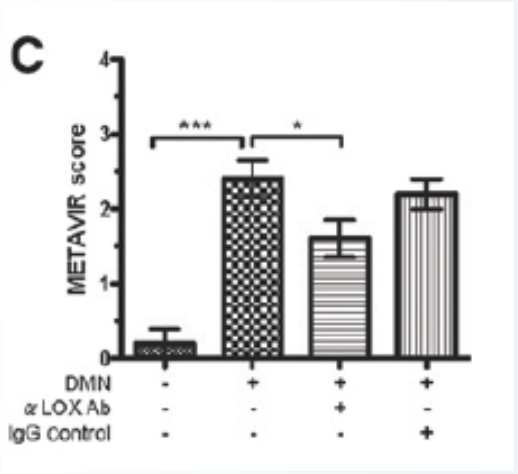
Publication from Arresto which formed the scientific basis of its acquisition by Gilead in 2010

Microenvironment and Immunology

Cancer Research

LOX-Mediated Collagen Crosslinking Is Responsible for Fibrosis-Enhanced Metastasis

Thomas R. Cox[1,2,3], Demelza Bird[2,3], Ann-Marie Baker[2], Holly E. Barker[2], Melisa W-Y. Ho[4], Georgina Lang[2,3], and Janine T. Erler[1,2,3]



LOXL2 inhibition decreases hepatic fibrosis

LOX inhibition decreases hepatic fibrosis

Excellent target validation for lysyl oxidase inhibitors

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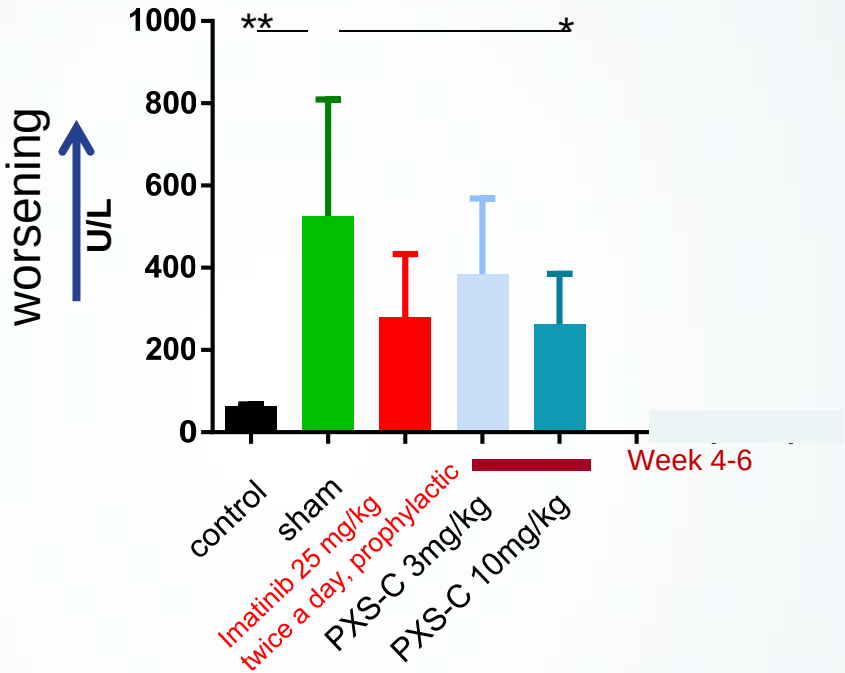
Rat liver fibrosis model

Liver function

Concentration of liver enzyme (ALT) in the plasma is a biomarker for liver disease progression.



- Improvements in liver function are a surrogate for human liver trials
- Imatinib (Gleevec) is a gold standard in animal models
- Pharmaxis LOXL2 inhibitors perform as well but are given once a day at a lower dose

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Collaboration with Synairgen

- True research collaboration with experts in respiratory diseases and fibrosis.
- Synairgen will lead and finance pre-clinical development of one LOXL2 inhibitor for IPF.
- Joint Research Committee will oversee research and development for IPF.
- Pharmaxis maintains options to develop LOX/LOXL2 inhibitors for other fibrotic diseases or cancer.

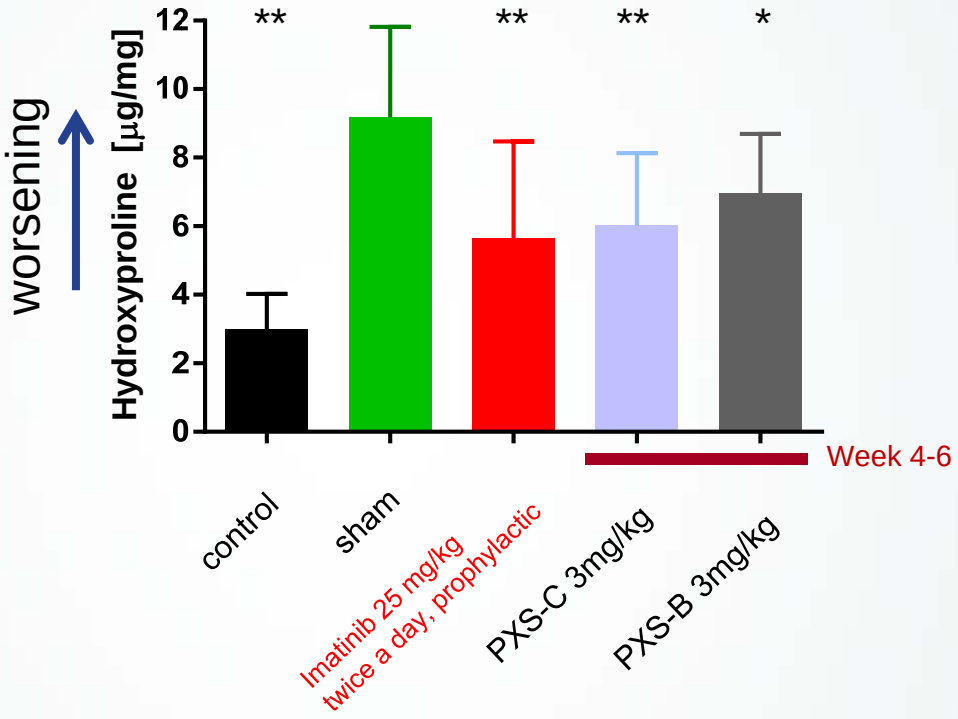
Pre-clinical candidate profile

Feature	
Potency	• *In vitro* pIC50 against human recombinant LOXL2 • Mechanism-based inhibitor criteria fulfilled (irreversible, substrate competition, time dependency) • No difference against native human native protein and mouse and/or rat LOXL2
Selectivity	• Selectivity for LOXL2 over LOX • Selectivity versus other amine oxidases
Specificity	• Eurofins / CEREP panel screen:
DMPK / ADME	• CYP inhibition (human) • Hepatocyte stability (dog, rat and human) • Plasma stability (dog, rat and human) • Plasma protein binding (dog, rat and human) • Oral bioavailability rat and dog • $t_{1/2}$ in plasma after oral and intravenous dosing
Pharmacology	• Efficacy in the Bleomycin-induced lung injury • Efficacy in ex vivo tissue model using IPF cells demonstrating inhibition of crosslink formation
Toxicology	• Functional hERG • Negative AMES test • HepG2 cell Health assay • Phospholipidosis in HepG2

Rat liver fibrosis model

Total collagen

Fibrosis is due to accumulation of collagen. Hydroxyproline is a surrogate measurement for collagen.



- Total collagen as measured by hydroxyproline was significantly reduced by Pharmaxis LOXL2 inhibitors.
- PXS-B is distributed to the liver and not present in other tissues.

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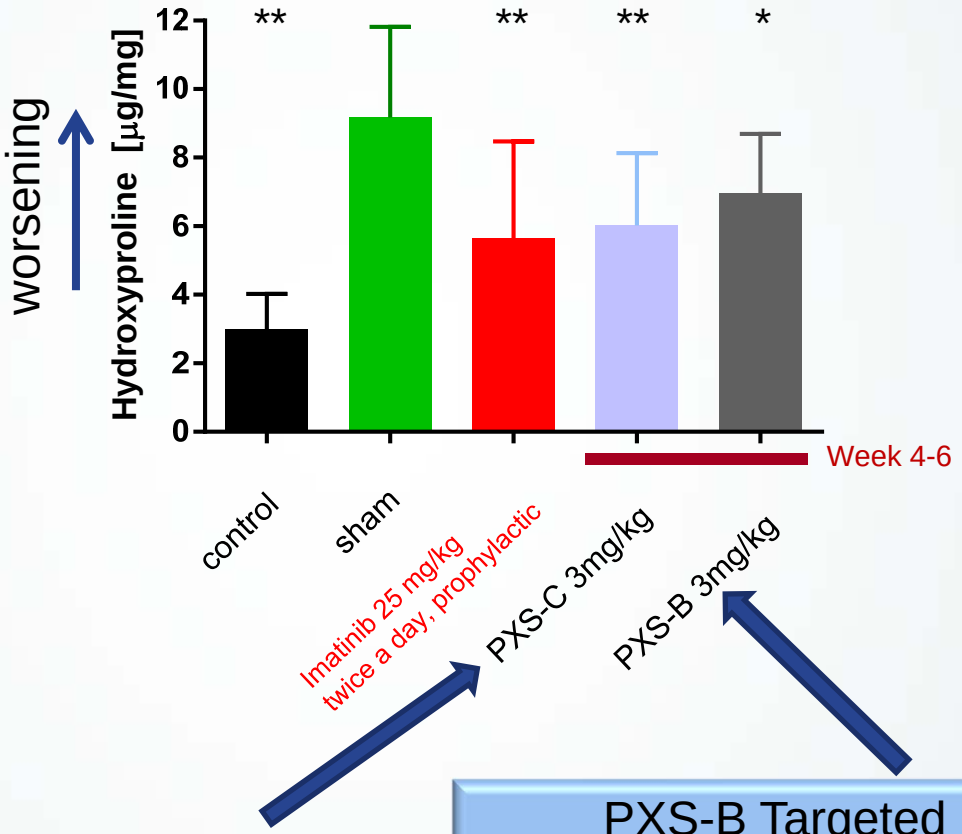
Rat liver fibrosis model

Total collagen

Fibrosis is due to accumulation. Hydroxyproline is a surrogate measurement for collagen



PXS-C All-rounder
Reduces various types of fibrosis

PXS-B Targeted Inhibitor
Reduces liver/kidney fibrosis
Different pharmacology (LOX family)
Different distribution

LOXL2 program
Achievements

- **Small molecule selective LOXL2 inhibitors for the treatment of fibrosis.**
- **Efficacy in pre-clinical models and drug-like properties.**
- **Collaboration with Synairgen on the development of LOXL2 inhibitors for the treatment of IPF.**
- **Pharmaxis' focus on other fibrotic indications and cancer.**
- **The first molecules are entering full pre-clinical development and Phase 1 ready in 1H 2017.**

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innovating for life

Business Development Perspectives

Melbourne; 22nd September

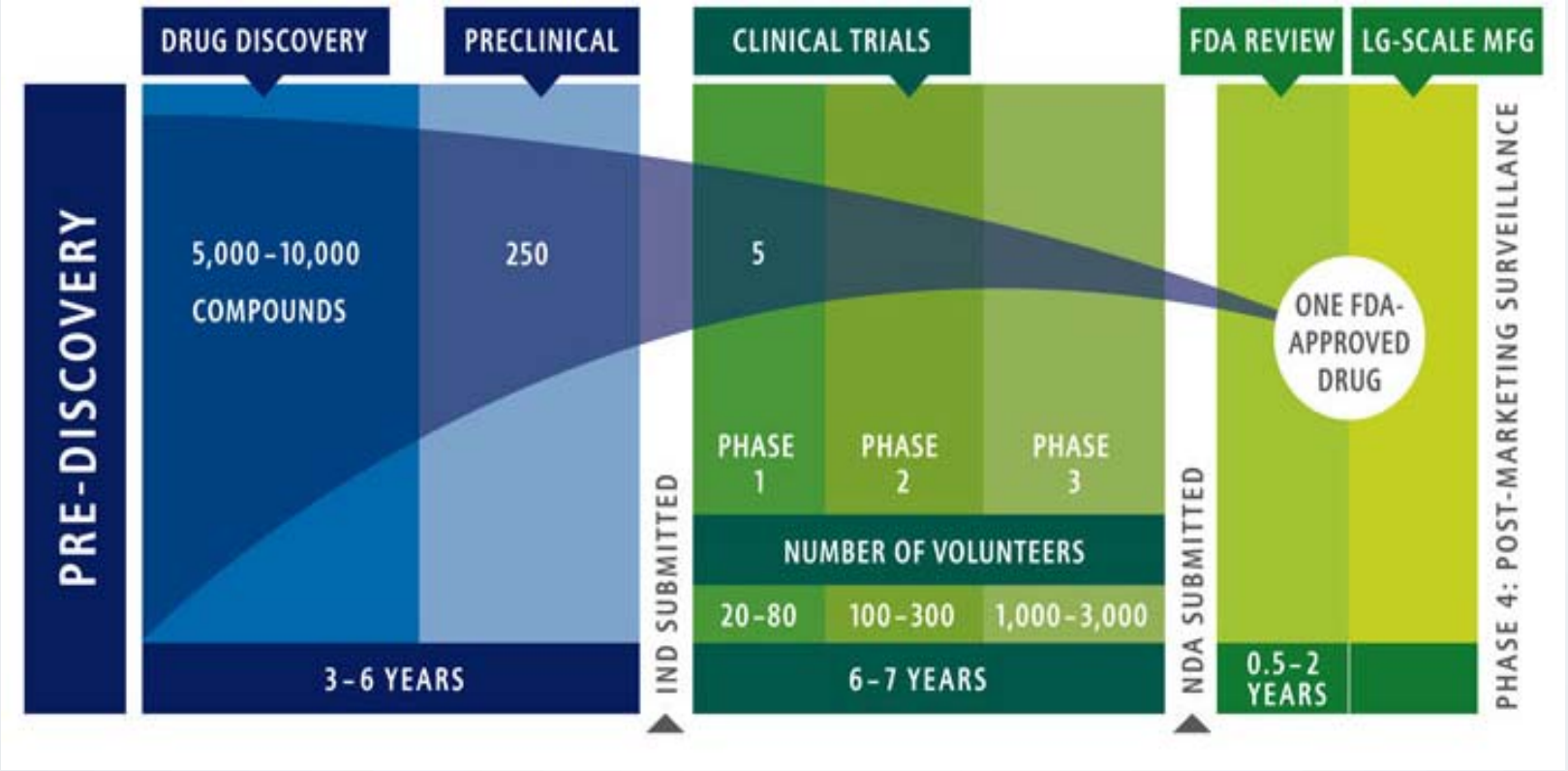
Sydney; 24th September

Simon Buckingham
Non executive director

Overview

- Perspectives on deal-making in Big Pharma
- The Pharmaxis experience
- Fibrosis deals 2010-2015
- The Pharmaxis/ Boehringer Ingelheim deal

Drug Development = Challenge!



Source: Pharmaceutical Research and Manufacturers of America

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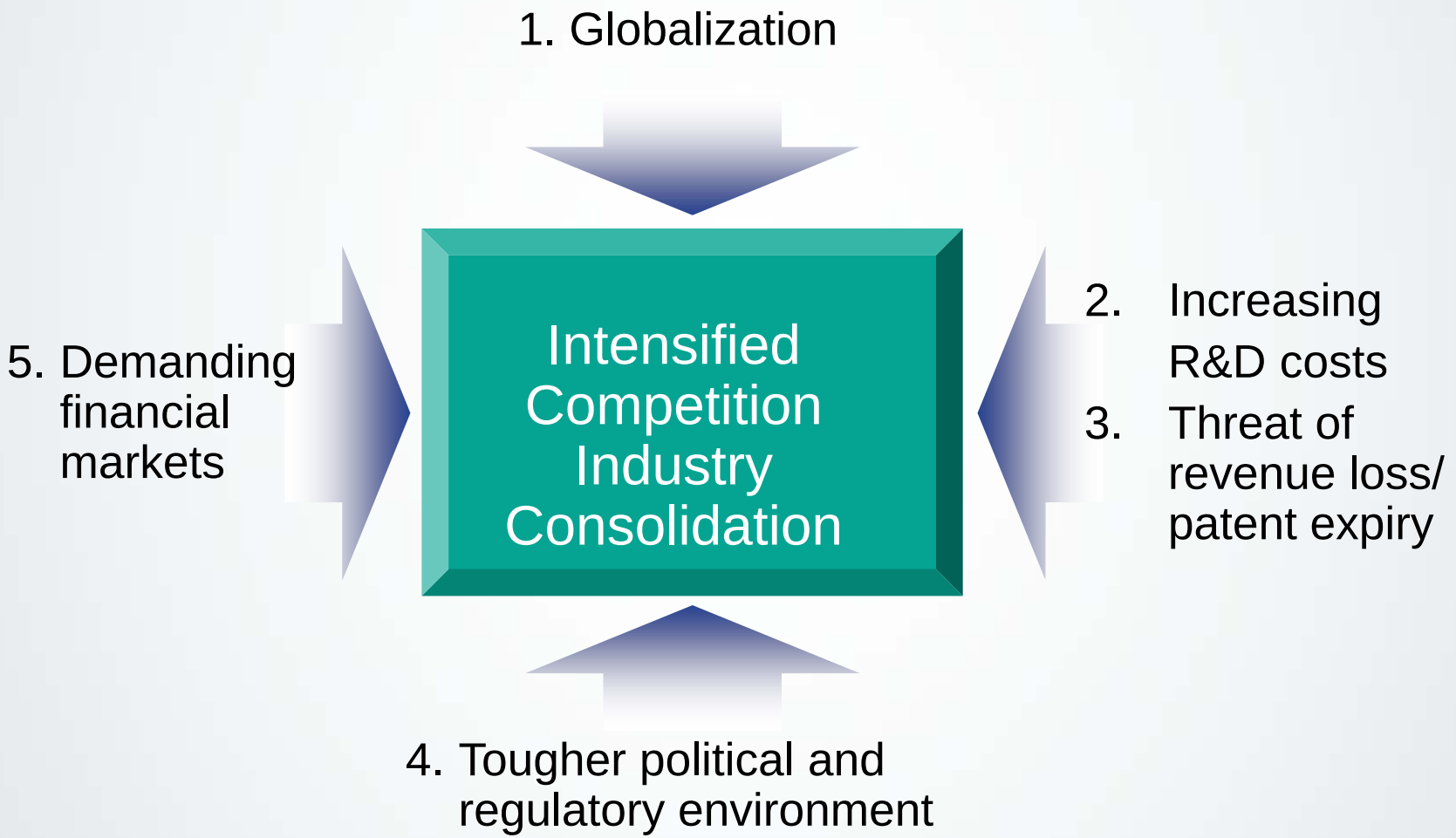
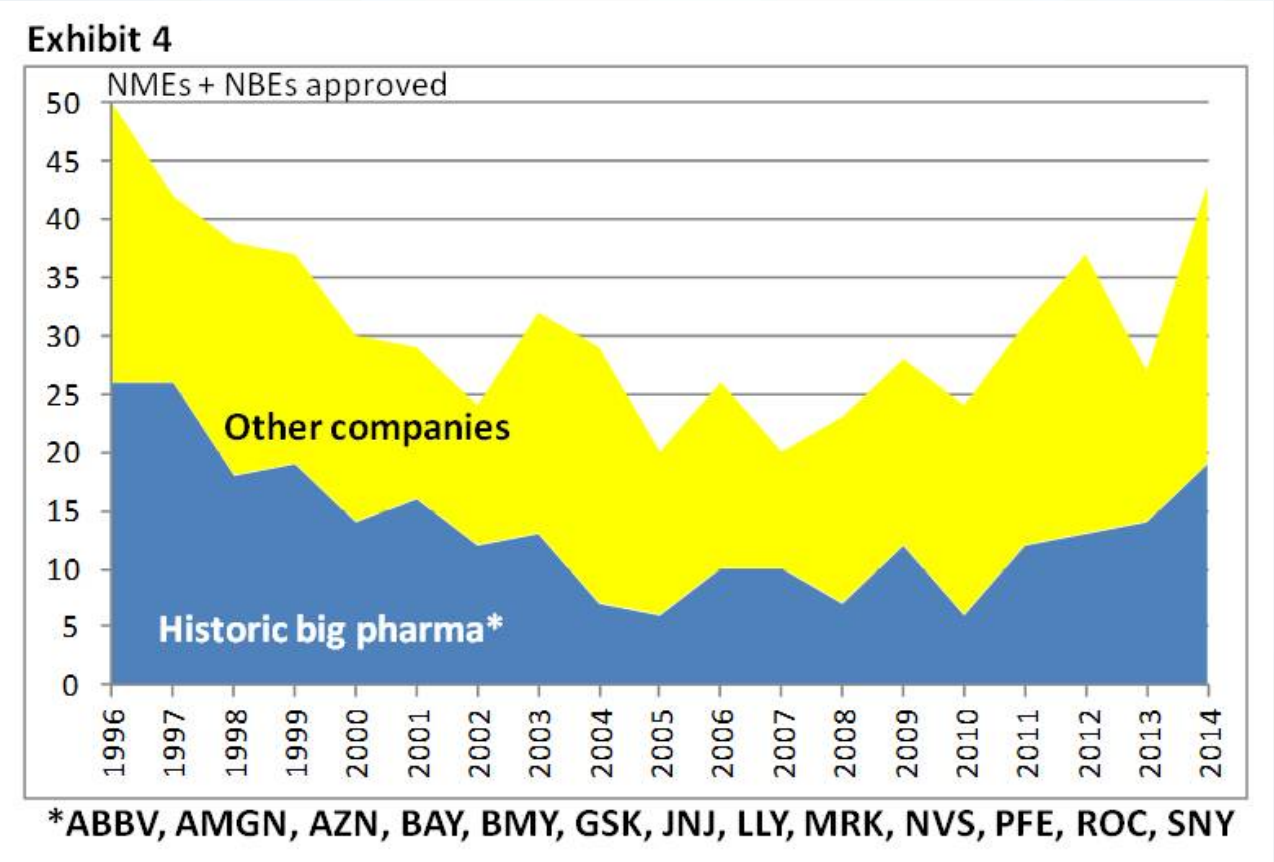
Drivers for change in pharma industry



Key factors

- Increased R&D cost to bring one drug to market - $2.6B (Tufts 2014)
- Research “stagnation” in large bureaucracies
- Drug approval recovering, but increased challenges – risk averse agencies, higher bar for approval, black-box warnings, post-marketing commitments and market withdrawals
- Revenue loss through patent expiry – US$44B in 2015

FDA approval rates



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Consequences

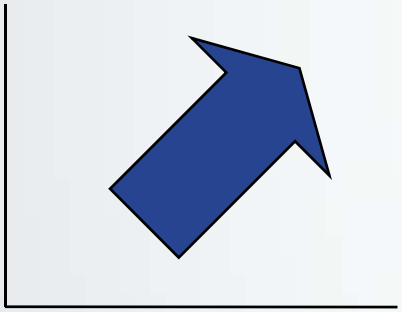
- Greater portion of R&D funding on licensing – now over 20%
- Fear of failure = More irons in fire
- Pay for success
- Increased number of collaborations/ alliances – now well over 100 Pharma/ Biotech per year
- External products account for >2/3 of Big Pharma sales – discovery deals, licensing, M&A

Deal competition

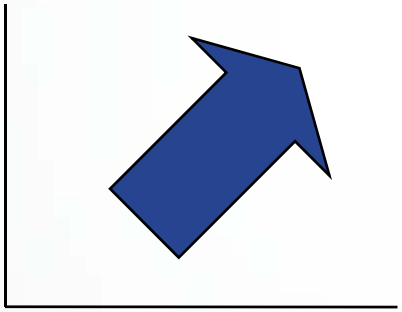
- More companies chasing fewer good targets
- Licensees more active in driving the process
- Fewer bargains
  – existing deal benchmarks known to both sides
- More creative, accommodating, collaborative deals
- Rise of option deals

Law of supply & demand
Deals are expensive!

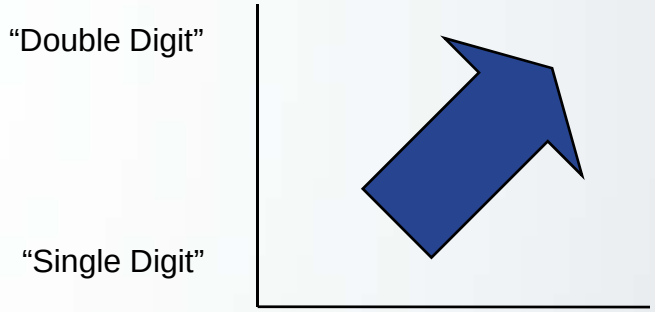
Upfronts



Total milestones

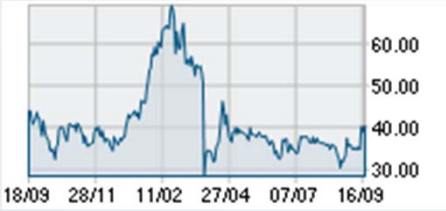


Royalty rates



Nasdaq Biotech Index
2 year performance

Genfit Pharma (phase 2) mkt cap: €958m



Intercept Pharma (PBC: approval; NASH phase 2) mkt cap: US$4.6B

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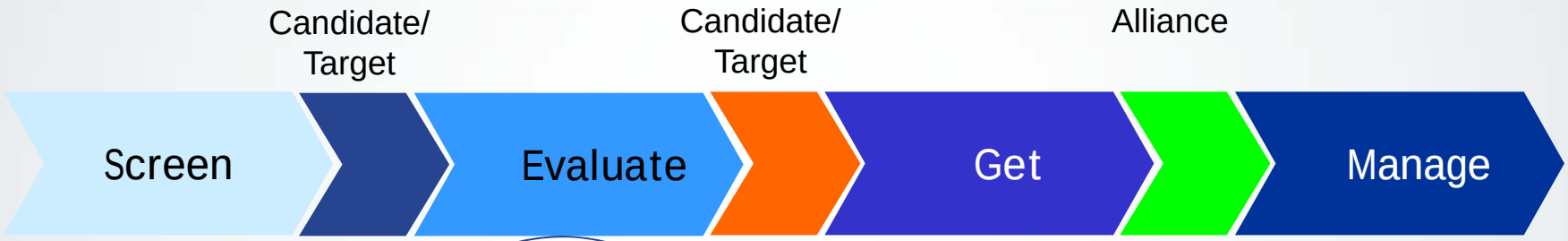
The process

Screen > Evaluate > Get > Manage



Identification

- Proactive/reactive
- Establish visibility
- Contact sources
- Proactive PR
- Scouting at public and private labs
- Network
- Funnel and screen opportunities

Scientific evaluation, prioritization

- Strategic fit
- Science
- Clinical
- Manufacturing
- Marketing
- IP position
- Competition
- Economic
- Due diligence

Corporate BD

- Transaction preparation
- Term negotiations, 'Pricing'
- Due diligence including exit strategy(ies)
- Contract negotiation

Value creation

- Alliance planning and organization
- Alliance kick-off
- Implementation, governance

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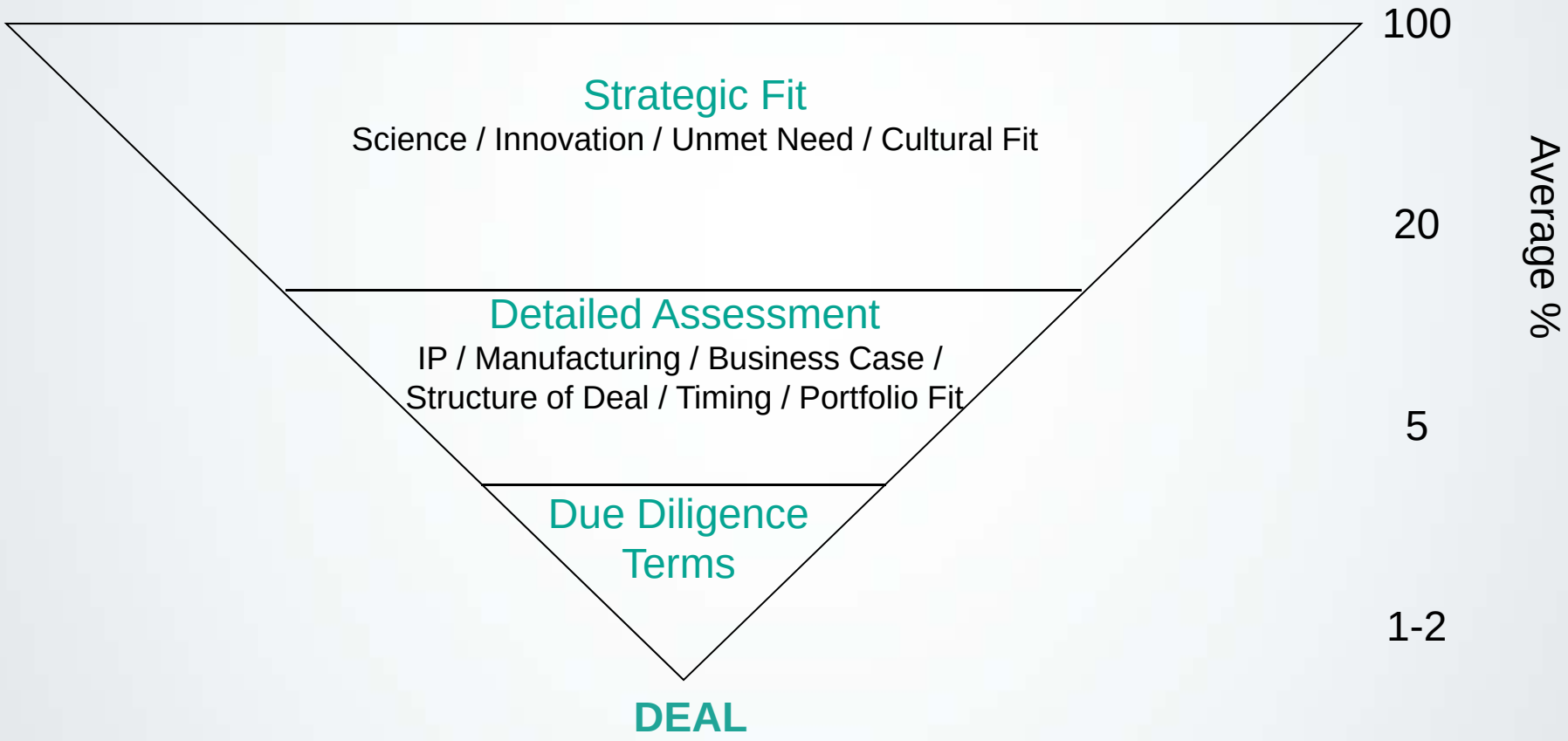
Company and product filter



The Pharmaxis experience

- Novel compound, high unmet need, large patient pool – gets attention!
- Proof of concept and scientific/ clinical advocacy crucial
- Understand partner needs/ dynamics – beware “Not Invented Here” mentality!
- Negotiations only after extensive due diligence
- Personal relationships and need for an internal advocate/ champion
- Getting senior management over the line!

Fibrosis deals 2010-2013

Pharma	Biotech	Indication/Asset	Phase	Deal Terms
Gilead	Arresto	**IPF, NASH, Cancer** LOXL2 antibody	Phase 1	• Paid **$225M** to acquire co. • Including monoclonal antibody manufacturing and research sites
Biogen Idec	Stromedix	**Fibrosis** Anti TGF beta antibody	Phase 2 ready	• Paid **$75M** upfront to acquire co. • Up to **$487M** total in development and sales milestones; No royalties • Multiple indications
BMS	Amira	**IPF/ Fibrosis** LPA1 antagonist - small molecule (Also preclinical asset for neuropathic pain and cancer)	Phase 2 ready	• Paid **$325M** to acquire the two assets • Up to **$150M** in additional milestones

Fibrosis deals 2014

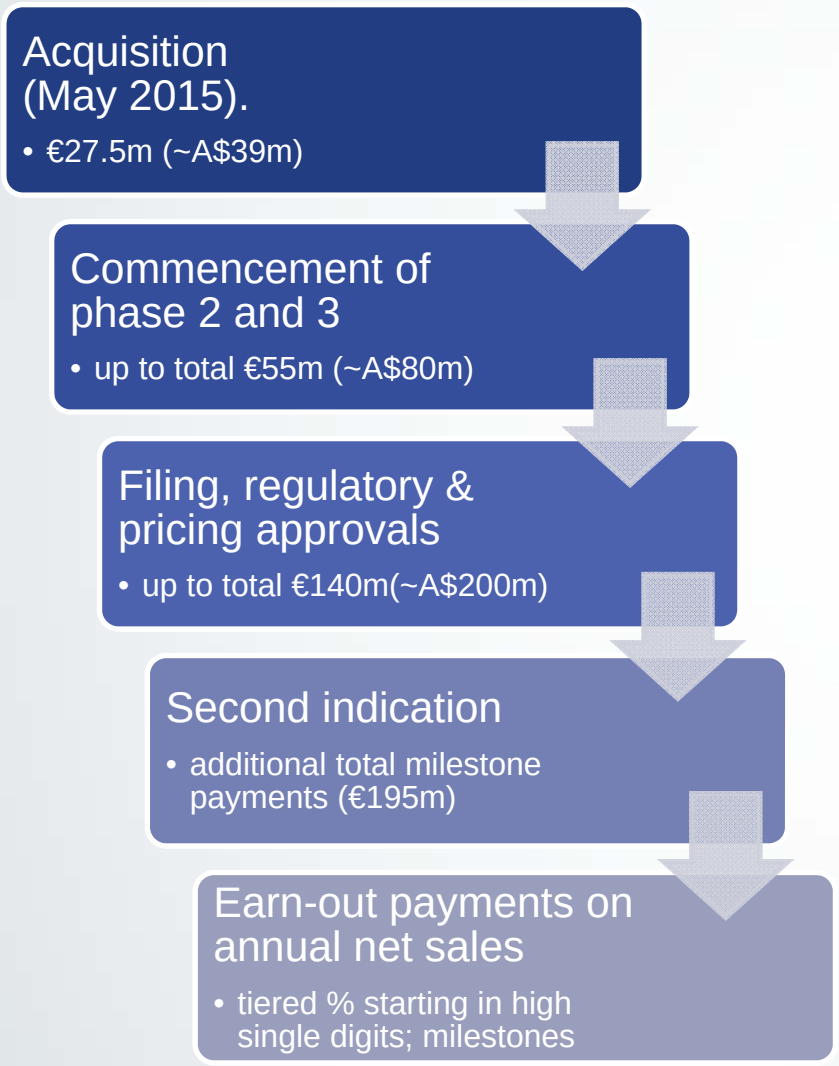
Pharma	Biotech	Indication/Asset	Phase	Deal Terms
BMS	Galecto	**IPF** TD139 - novel inhaled galectin-3 inhibitor	Phase 1	• Option to license • Total payments up to **$444M** • Includes option fee and exercise fee • Clinical/ regulatory milestones
Shire	Fibrotech	**Diabetic nephropathy/fibrosis** FT011	Phase 1b	• Company acquired for **$75M** • Total payments up to **$482M** • No royalties/ commercial milestones
Shire	Lumena	**Cholestatic liver disease** - LUM001 **NASH** - LUM002	Phase 2	• Company acquisition for **$260M** • 2 late stage assets

Fibrosis deals 2015

Pharma	Biotech	Indication/Asset	Phase	Deal Terms
BMS	Promedior	**IPF and Myelofibrosis** PRM151 - recombinant human pentraxin-2 protein	Phase 2 (in progress)	• Total payments up to **$1.25B** • Upfront cash for right to acquire co • Exercise fee • Clinical/ reg milestones
Gilead	Phenex	**NASH** Farnesoid X receptor - small molecule	Phase 2 (in progress)	• Total deal value **$470M** • Asset acquisition • Undisclosed upfront payment, development and commercial milestones. No royalties
AZ	Regulus	**NASH** MicoRNA (undisclosed)	Preclin	• **$125M per compound** includes development and commercial milestones • $2.5M for option to license RG-125 • $3M paid before for rights to option 3 compounds in discovery alliance.

Boehringer Ingelheim

acquisition of PXS4728A



- **Competitive deal**
  - Demonstrates PXS ability to negotiate valuable global deals
  - Total potential payments to approval for 2 indications: €418.5m (~**A$600M**),
  - Plus potential sales milestones, and potential earn-out at high single digit % of sales
- **Excellent partner**
  - Boehringer leaders in metabolic disease
  - Industry leading development times
  - Boehringer responsible for all development, and commercialisation activities
- **External validation of PXS drug discovery**

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Summary

- Boehringer Ingelheim deal:
  - Great terms, but excellent Phase 1 asset
  - A$39M upfront
  - Total potential > A$600M
- Clear internal strategy to build fibrosis/ inflammation powerhouse
- Drug discovery team delivering – Phase 2 ready product; array of novel/ innovative leads
- Proven business development ability:
  - Extensive international network
  - License to Big Pharma (BI)
  - Novel research collaboration (Synairgen)