

Lecture #9

Feedback and resources for the group project

Aims:

- Get prepared for your group pitch and C4L application

Course content and schedule 2024

Lecture #/Date	Topic	Details	Seminar tasks
1/ 12.09	General Introduction	Aims of the course, expectations, tasks and assessments General proceeding	Watch Elisabeth Holmes Documentary (Theranos story)
2/ 19.09	Roadmap from academic idea to startup	template business example, Learn about all the steps needed to translate a scientific idea into a startup and what your pitch deck should include => Focus on Value proposition and Business model	Define customer value proposition, USPs and business model (= business example) of Theranos Grouping and assignment of individual presentations
3/ 26.09	Market analysis	Market size, competitors, customer models, growth and scalability,	Introduction into GlobalData, Find market data on your business example & group innovation
4/ 03.10	Corporate planning	Business models, exit strategies, website & visibility,	Define business example of your group innovation, define markets and competitors
5/ 10.10	Business examples	Business examples 1-4 , detailed feedback	
6/ 17.10	Timelines & initial steps – work plan	Business examples 5-8 Milestones and finance plan from idea to startup/product	Find & analyze patents in your field
24.10 – no lecture!			
7/ 31.10	Intellectual property and other legal issues	Business examples 9-12 Patents – facts, data bases, examples Concept of freedom to operate, regulatory hurdles, etc.	Prepare milestones and financial plan for your startup idea
8/ 07.11	How to secure funding	Business examples 13-16 Public funding programs, investments, venture capital, EPFL programs	Finalize pitch deck
9/ 14.11	Finalizing the pitch deck	Business examples 17-20 Final feedback on individual case studies, last year’s best group pitch, time for questions	
11/ 21.11	Guest speaker Daniel Alpern (EPFL entrepreneur)	Business examples 21-24 Real world example by an EPFL entrepreneur	Prepare Executive Summary and commercial potential in C4Lformat
12/ 28.11	Guest speakers Gautam Maitra (EPFL C4L)	Introducing C4L initiative (funding at EPFL)	
13/ 05.12	Pitches Groups A (e.g. 4-6) Feedback Groups B (e.g. 1-3)	10min pitches with non-presenting students to provide written feedback, Submission of Executive Summary and commercial potential in C4Lformat	Prepare written feedback on other group’s pitches
14/ 12.12	Pitches Groups B (e.g. 1-3) Feedback Groups A (e.g. 4-6)	10min pitches with non-presenting students to provide written feedback, Submission of Executive Summary and commercial potential in C4Lformat	
15/ 19.12	Trophy Award & Feedback		

General feedback on case examples

- A single figure/image is often better than 10 sentences!
- Use simple and easily understandable language rather than specialized tech terms
- Investments and spending on R&D are not part of the business model. In the business model you should show how revenue is generated (who pays whom for what?)
- While for the case example some company information might not have been available, you have to provide a complete and comprehensive picture of your (hypothetical) group startup
- You should be able to show that your business is scalable
- You should know who your main competitors are
- Know the limitations of your product and be ready to discuss constructively
- Please avoid mixed French and English slides
- Be self-confident, without overselling your invention



Business Plan

['biz-nəs 'plan]

A document that defines in detail a company's objectives and how it will achieve them.



Business Plan

- **Customer's needs**
- **Market**
- **Profit**



1. Executive Summary

Do

- Describe in **simple terms** your mission and vision (big picture in real-world language), point out your competitive advantage, provide some basic market data
- **Sell a vision**, not just a product!
- Point out why this is **an opportunity no investor should miss** (e.g. scalable, disruptive)?

"My 2 US\$ assay strip allows diagnosing breast cancer at curable stage, using a single drop of urine"



Don't

- Discuss **irrelevant technical details**,
- **Oversell** your product or market chances
- Be too optimistic, naïve, "all over the place"...
- **Lack understanding** of the market/ customer needs
- Gaps and missing facts or data. **Immature "assumptions"**

"My new HfO₂-Based Ferroelectric CMOS sensor is 2.37 times faster than any MESO transistor"



2. Opportunity (problem statement)

Do

- Easy language or better an **image illustrating the problem**
- **Facts and numbers**



The Problem

Plastic production and recycling

- 460 million tons of plastics produced worldwide every year
- 350 million tons of plastic waste generated worldwide
- 9% is recycled!
- 22% of plastic waste is mismanaged

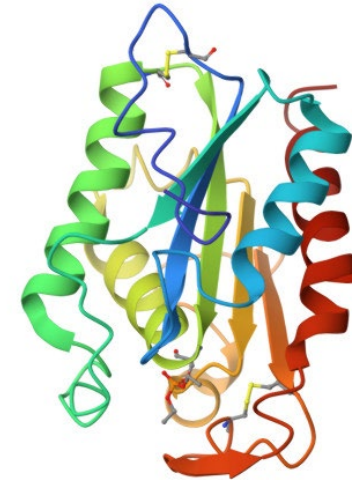


(Courtesy of Alice Klein – BIO-490)

Don't

- Technical language, **describing a problem that nobody except you is aware of**

“No Cutinase enzyme can stand high temperatures”



www.rcsb.org/structure/2CUT

2. Opportunity (problem statement)

Do

- Easy language or better an image illustrating the problem
- Facts and numbers



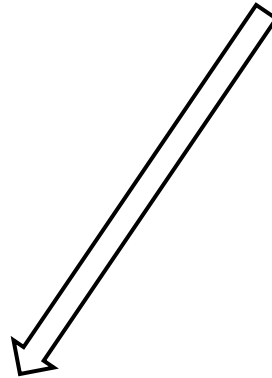
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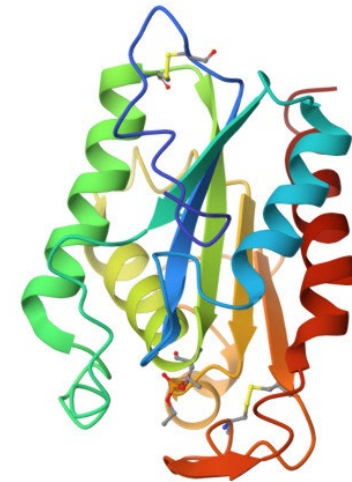
This is the real problem



This is where your technology might have USPs



"No Cutinase enzyme can stand high temperatures"



www.rcsb.org/structure/2CUT

(Courtesy of Alice Klein – BIO-490)

3. Product (Solution, competitive advantage)

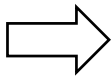
Do

- Describe a **sustainable competitive advantage**, no “one hit wonder”
- In the best case your invention is not just better than previous products, but **generates entirely new needs**

phone



<https://pxhere.com/en/photo/591564>



www.simplymac.com

phone,
email,
internet,
navigation,
Apps

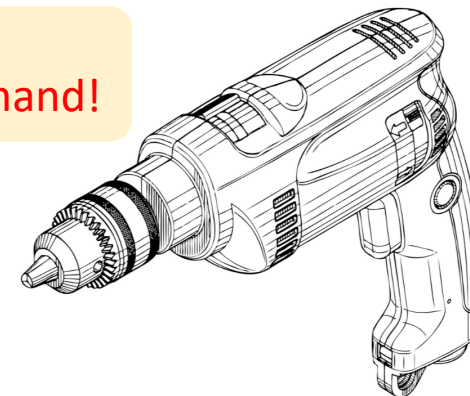
Don't

- **Overfulfil a task** at non-competitive cost

“Our innovative power tool has a battery lasting long enough to drill 10,000 holes without recharging....(and it costs 2k US\$) ”

#1 Failure:

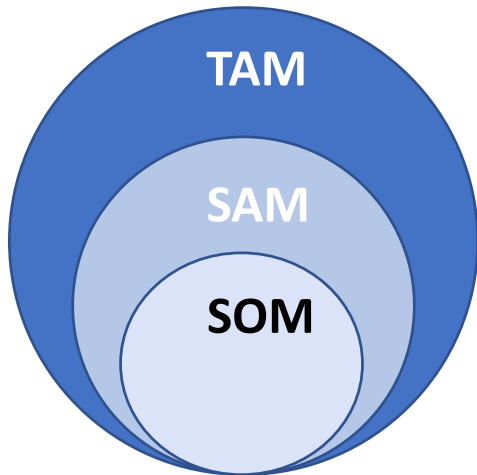
Lack of market demand!



4. Market & Marketing

Do

- Describe who will buy your product, how you reach your (first) customers, define distribution channels and provide quantitative market data
- Get LoS from key opinion leaders and industry



Total addressable market = X

Serviceable addressable market = Y

Serviceable obtainable market = Z

Don't

- Mix up total societal cost generated by the problem with your market
- Assume getting a 100% market share
- Project growth that does not match resources (staff, local distributors, regulatory hurdles)



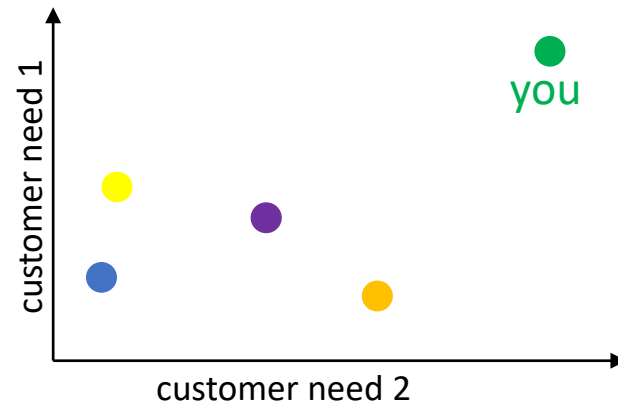
*"The total economic cost of cancer is 1.3 trillion US\$ per year
=> we will at least make 100 billion with our new cancer drug"*

5. Competitor landscape

Do

Clear comparison, pointing out superiority
(tick box table, 2D performance plots, SWOT, etc.)

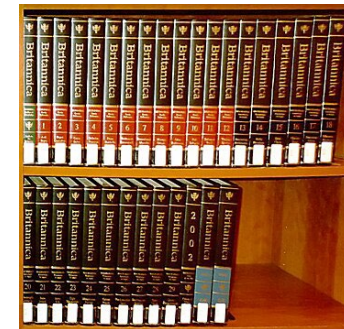
	Competitor 1	Competitor 2	You
Parameter 1	✓	✓	✓
Parameter 2	✗	✗	✓
Parameter 3	✓	✗	✓
Parameter 4	✗	✓	✓
Parameter 5	✗	✓	✓
Cost	~1,500-5,800 US\$ 	2500 US\$ 	350 US\$ 



Don't

Just focus on a single technical parameter

Overlook future developments and alternative technologies



#4 Failure:
Strong competition

6. IP

Do

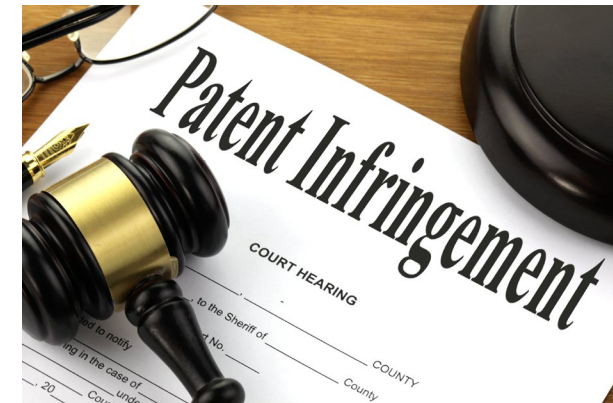
- Check if others could offer a similar product (if so, could you still have an advantage)?
- Build up a comprehensive patent portfolio protecting different aspect of your technology (hardware, assays, special reagents, etc.)
- Get all required licenses



<https://icon-icons.com/icon/certificate/129074>

Don't

- Forget to check for FTO
- File patents that are too narrow and easy to bypass



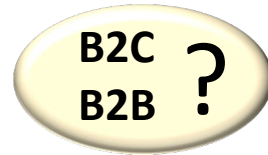
<https://pix4free.org/photo/4695/patent-infringement.html>

7. Business Model and Revenue Strategy

Do

Don't

- Find the right business and payment models for your product
- End up with a business model that is not scalable



Subscription

The subscription business model charges customers a recurring fee -typically monthly or yearly – additional **private health insurance packages** can be considered as a subscription model.



Direct sale (or e-commerce)

Under a direct sales business model, sales of products or services generate revenue through a network of salespeople, who sell directly to customers. Examples are e.g. **23andMe**.



Freemium

The freemium model works in a few different ways but most popularly companies use it by offering a “free trial” of their product or service or a “limited free version” of their product or service. E.g. for **healthcare Apps** and online medical consulting.



Product to Service

It allows customers to purchase a desired result rather than the equipment that delivers that result. The user pays as and when they access the service, as opposed to paying a for a product. **NGS companion diagnostic tests** are carried out this way



Leasing Model

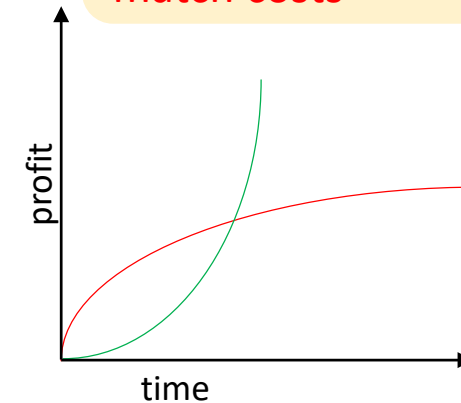
Under the leasing model, a company buys or produce a product and then leases it to customer for a periodic fee. Not unusual for **large equipment**, including e.g. annual service contracts.



Razor Blades

Companies offer a cheaper product that includes more expensive accessories. When you purchase a razor from the drugstore, you will notice that the replacement razor blades cost more than the razor itself. Examples such as e.g. the **Roche Light Cycler**

#5 Failure:
Pricing doesn't
match costs



Adapted from <https://fundsnet.services.com/types-of-business-models>

8. Team

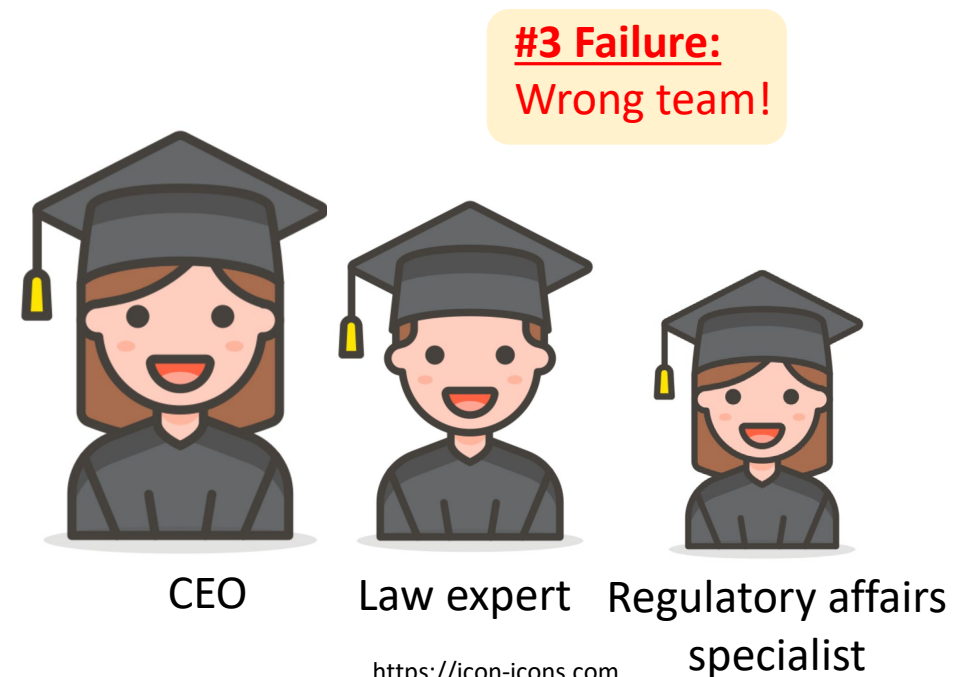
Do

- Convey credibility, ensure all required expertise, skills and network are readily available
- Get key opinion leaders onboard



Don't

- Do things for which you have no expertise – faster and potentially even cheaper to outsource!



<https://icon-icons.com>

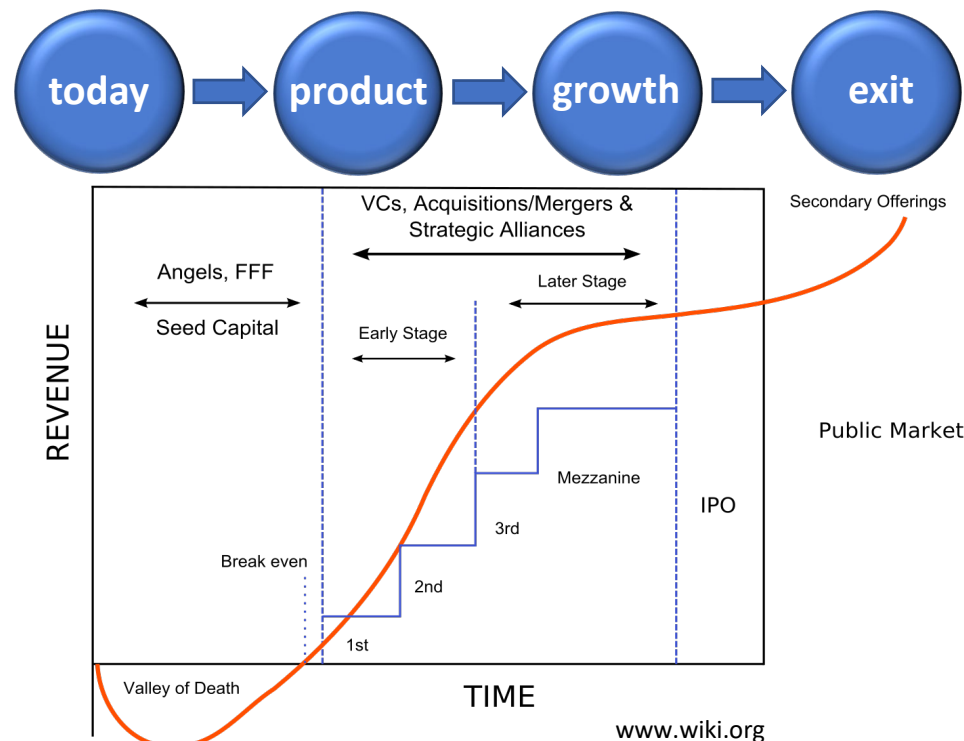
9. Development Plan, Milestones & Financial Forecast

Do

- Keep in mind the many different cost categories (business canvas)
- Leave room for delays (they will happen!) and consider all risks
- Define minimal viable product and minimal marketable product
- Make sure your resources match your goals
- Define your exit strategy

Don't

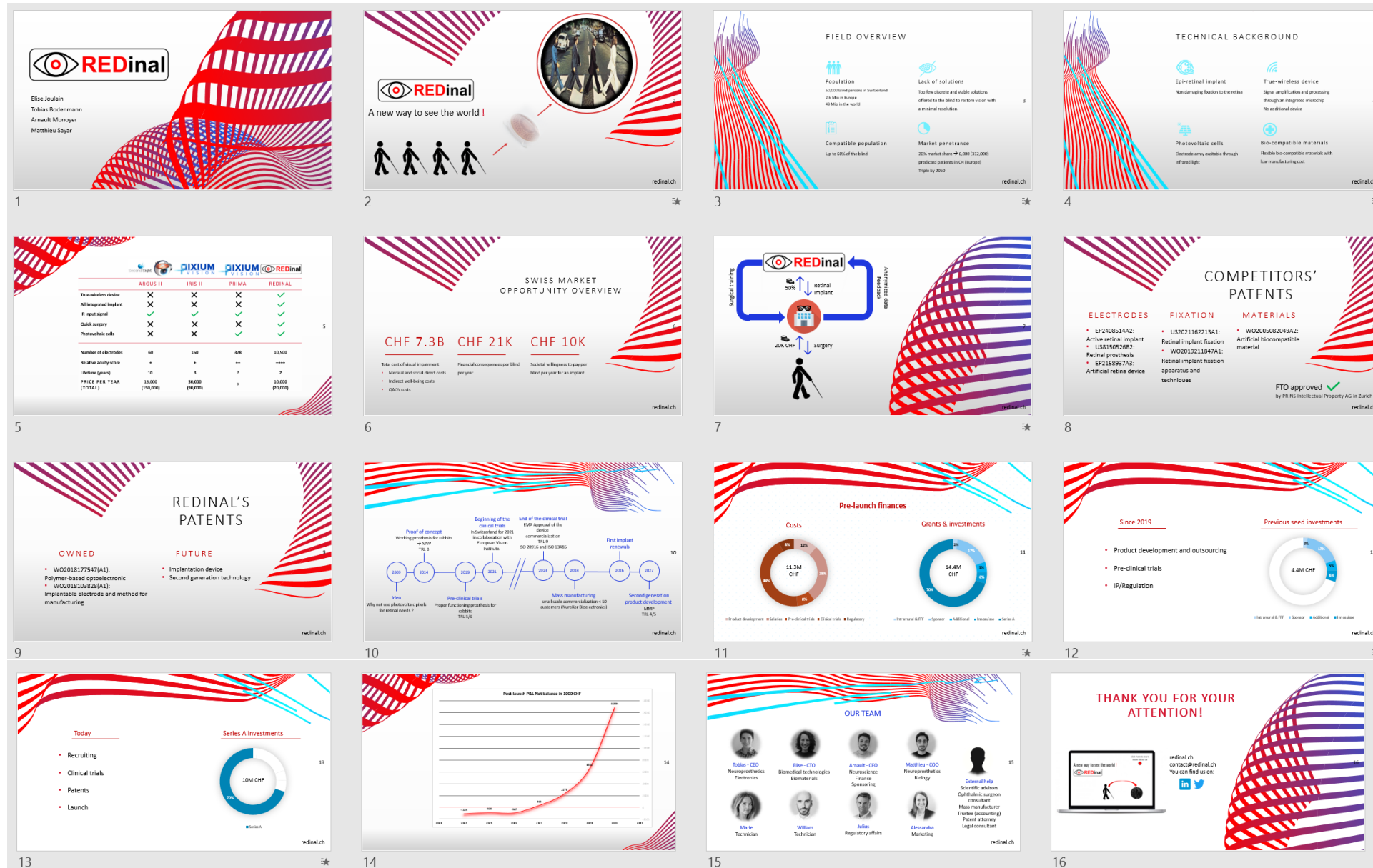
- Mix up revenue/sales with profit
- Aim for a “technical overkill” (you can launch a 2nd generation product later)



#2 Failure:
Insufficient financial resources

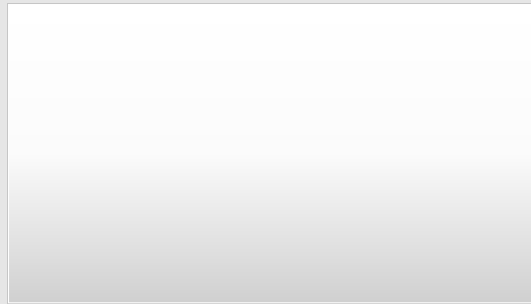


Best group pitch 2021

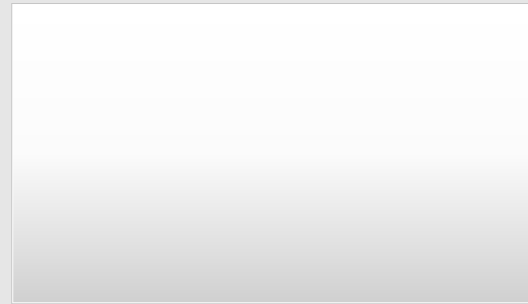


Please do not just copy, but rather come up with your style, structure and layout!

Prepare backup slides with important facts and figures



17

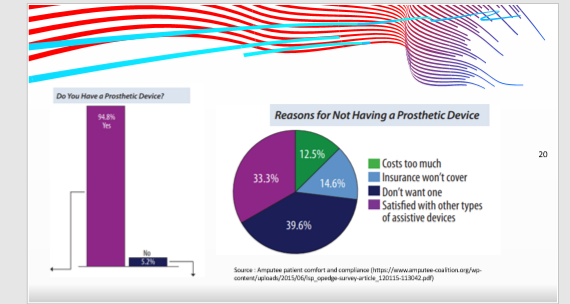


18

Field Overview

- 60% curable -> intact optic nerve needed
 - Cure retinitis pigmentosa (RP) and age-related macular degeneration (AMD)
- 1 out of 2 blind people expected to get implant
- Estimate to reach 40% of the remaining patients
- (...) estimates that global blindness will triple by the year 2050 (...) it projects that cases of blindness will increase from 36 million to 115 million by 2050. (The Lancet Global Health)

19



20

Important Numbers

- 50 000 blind people (CH) -> 30 000 of curable patient (60%)
- Economic burden in the USA: 139 billions USD for 2,6 million visually impaired including 1 million blind people without considering QALYs and DALYs
- Blind individual vision cost per year = 26 900 USD (71,7 billion USD)
- Government payment = 47,4 billion USD
- Private insurance = 22,1 billion USD
- Indirect cost = 72,2 billion USD (see what percentage we can reduce)
- The cost for guide dogs per year (62 million USD) will disappear with regain of autonomy
- Medical cost per person = 7000 USD
- Productivity loss = 12,5 billion USD
- Nursing home Cost = 7,5 billion USD

21

Important number in Switzerland

- Direct costs (medical and social) = 800 million CHF
- Indirect costs = 1,5 billion CHF
- Economic burden of QALYs = 5 billion CHF
- 21 years of blindness with a weight of 1/3 (Average age = 62 to life expectancy = 83) 7 QALYs
- Financial consequences = 21 000 CHF per blind per year
- The Probabilistic Incremental Cost-Effectiveness Ratio (ICER) was estimated to be 28 588 Euros per QALY for ARGUS II our main competitor
- 3 years of blindness = societal willingness to pay 30 500 CHF in Europe

22

BMC Ophthalmology

The cost-effectiveness of the Argus II retinal prosthesis in Retinitis Pigmentosa patients

And Viorica¹, Elia Bergeles², Rod S. Taylor³, José-Alain Sahel⁴, Stenoua Rizzo⁵, Paulo Eduardo Stanga⁶, Roberto A. [View Article](#)

BMC Ophthalmology 14, Article number: 49 (2014) | [Cite this article](#)

116 Accesses | 14 Citations | 7 Altmetrics | [Metrics](#)

Abstract

23

ACTIVE RETINAL IMPLANT

- EP2408514A2: SUBRETINAL ELECTRO ARRAY
- Extra-ocular device needed to process the signal and transmit it through a wire

RETINAL PROSTHESIS

- US8150526B2: SUBRETINAL ELECTRO ARRAY
- Extra-ocular mount with transmitter and processors for treatment of the signal

24

ARTIFICIAL RETINA DEVICE

- EP2158937A3
- Date of filing: 01 May 2001

RETINAL IMPLANT FIXATION

- US2021162213A1
- Fixation damaging retina because of a rigid implant

25

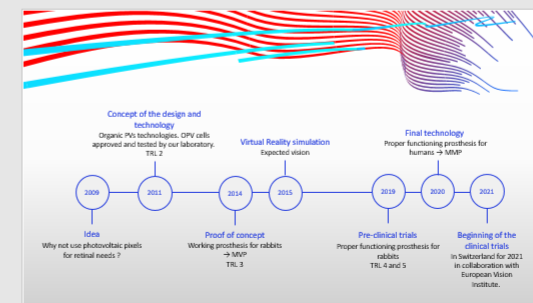
RETINAL IMPLANT FIXATION APPARATUS AND TECHNIQUES

- WO2019211847A1
- Implants separated in two part: epiretinal and an anchor in the ciliary bodies of the eye damaging the eye

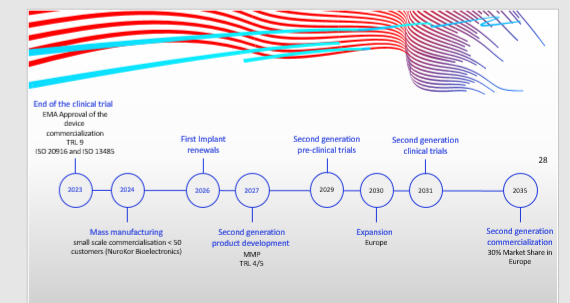
ARTIFICIAL BIOCOMPATIBLE MATERIAL

- WO2005082049A2
- Cellulose single layer with pores and cell growth substrate for promotion of repair
- Subretinal space

26



27



28

Best group pitch 2022

Fre AI

AI by and for women

Your endometriosis diagnosis is only a click away

What is endometriosis?

"Endometriosis is a disease where tissue similar to the lining of the uterus grows outside the uterus, causing pain and/or infertility", WHO 2018

Main symptoms:

- painful periods
- chronic pelvic pain
- pain during and/or after a sexual intercourse
- painful bowel or bladder

→ Endometriosis affects 6-10% of the general female population
~190 000 women in reproductive age in Switzerland

Current situation

Diagnostic options:

- Clinical symptoms and ultrasound
- MR
- Laparoscopy

Average delay in diagnosis: 6.7 years

If not treated on time...

- Chronic pain and decrease in quality of life
- Higher risk of cancer
- High risk of infertility

Economic impact of a late diagnosis

Additional costs:

- Fertility treatment
- Hormone treatment

AI can be the solution.

What we need:

- Patient information
- Clinical history
- Symptoms
- Transvaginal ultrasound images

What we provide:

- Diagnosis support with 93% sensitivity and 99% specificity
- Mapping of endometrial tissue
- Easy monitoring

Our solution

- ✓ Pelvic endometriosis
- ✓ Endometriomas
- ✓ Deeply infiltrating endometriosis
- ✓ Abdominal wall endometriosis

From stage 2 (mild) on

Ultrasound images + patient's data

Fre AI

Clear diagnosis and precise treatment!

USPs

- Non-invasive
- Monitoring
- Reliable
- Low price
- No extra effort

Competitors

	Ziwig	MDNA Life Sciences	Fre AI
Diagnosis	✓	✓	✓
Monitoring	✗	✗	✓
Mapping	✗	✗	✓
Accessibility	Minimal	Minimal	Minimal
Stage of diagnosis	Early	Early	Early
Price	79.1.30 CHF	200.00 CHF	50 CHF

Intellectual Property

Leased:

- US10409440B1: Adaptive image processing in assisted reproductive imaging modalities
- US11445404B2: Artificial intelligence methods and systems for analyzing imagery

Owned patents:

- EP361513A1: Machine-learning based ultrasound image processing for endometriosis diagnosis and data storage platform

FTO: ✓
by PATS LTD in Neuchâtel

Market opportunity

Services in market today:
Initial 9% needs of endometriosis in Switzerland

Obtainable market today:
Endometriosis in Switzerland

Total addressable market:
Endometriosis worldwide

Market size

Evolution of the evolution of market size in Switzerland

Business model (B2B)

Subscription models

	Fre AI	MDNA	Ziwig
Price	50 CHF	200 CHF	79.1.30 CHF
Accessibility	Minimal	Minimal	Minimal
Stage of diagnosis	Early	Early	Early

Our road map

2018: First clinical trial
2019: Start of clinical trial
2020: Start of clinical trial
2021: Start of clinical trial
2022: Start of clinical trial
2023: Start of clinical trial
2024: Start of clinical trial

Seeking Series A funding

650K CHF target funds

Pre-launch Costs

- Regulatory: 10%
- Computational Costs: 10%
- Clinical trial: 10%
- Marketing: 10%
- Operational Costs: 10%
- R&D: 10%
- Other: 10%

Financial Forecast

Revenue (in 10'000 CHF)

Collaborations

- **Leading medical centers:**
 - University Hospital Lausanne (CHU)
 - Geneva University Hospitals Endometriosis Center (GHC)
- **Patient support organizations:**
 - Alliance for Endometriosis
 - Endo & Endo-Help (EHE)

Team

External members

- Dr. Marcello del Campo - Scientific advisor
- Steve Ross - Member
- Stefanie Perle - Legal advisor
- Stefanie Perle - Legal advisor
- Stefanie Perle - Legal advisor

Questions?

