D7.3 – REPORT ON THE FIRST INTERMEDIATE PROJECT MEETING

StretchBio – Project Meeting at month 6.

Identifier:	StretchBio_D.7.3_ Report on the First Intermediate Project Meeting
Work package:	WP 7
Dissemination level:	Public
Keywords:	Dissemination, Exploitation, Project Management
Abstract:	This document evinces that the second consortium meeting of the project took place through Teams (MS) tool at the sixth month of the project with all members actively participating. The content of this deliverable is labelled as public.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 964808.

Document history:

Version	Date	Reason of change
1	06/04/2022	Creation of the document
1.1	07/04/2022	Deliverable review and validation by Coordinator

Document author(s):

Entity	Contributor
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UB-IN2UB	Albert Romano-Rodríguez

Disclosure Statement:

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Executive Summary

StretchBio project commenced in September 2021 and will conclude in August 2025. The consortium members are convinced that the close collaboration between the partners is crucial to achieving the proposed objectives and thus, to facilitate the overall success. For this reason, a virtual meeting through Microsoft Teams tool was organized on April 1st 2022.

During this half-day meeting, partners had a unique opportunity to review the status of the project implementation and design a meaningful strategy to cope with the project commitments from month 6 to month 12, and beyond.

This meeting, which was initially scheduled for March 2022, was slightly delayed to accommodate the requirements of the consortium members. Nevertheless, this small deviation is not expected to impact the project implementation.

In this deliverable, the agenda and the high-level minutes of the meeting are provided with shreds of evidence that the meeting took place as initially foreseen. Here, no confidential information is given, and as a consequence, the document is labelled as public.

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Table of Contents

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Introduction

In this section, the official agenda for the meeting, as well as the high-level minutes are provided.

1.1 6-month Project Meeting Agenda

StretchBio

Continuous two-dimensional Stretch monitoring of fresh tissue Biopsies

Contract no. 964808
H2020-FETOPEN-2018-2019-2020-01

6-Month Meeting

March 2022

Venue: Online event. Access details to be provided separately

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Agenda

Time	Topic	Contribution
09:15	Arrival / Dial-in (Attendance and system check)	
09:30	Brief welcome & opening Overview and approval of meeting agenda	**UB-IN2UB** A Romano.
09:40	**EC Guidelines**	**EC-PO**
09:50	**StretchBio project** • Project implementation at M6 (overview)	**UB-IN2UB** A Romano.
10:10	**The Work Packages in detail** (*~20' each)* • Work package implementation at M6 • Interaction with other WPs • Deliverables • Overview of expected results at M12 - WP7: **Project management** UB	**WP leaders**
10:30	Coffee break	
10:40	**The Work Packages in detail** (*~20' each)* • Work package implementation at M6 • Interaction with other WPs • Deliverables • Overview of expected results at M12 - WP3: **Fabrication and characterisation of the nanosensor** DTU - WP4: **Tissue-nanopillar material compatibility** LEITAT - WP5: **Integration of light sources and detectors** ALU-FR - WP2: **Design and modelling of photonic crystals** UB - WP8: **Exploitation, dissemination, training and communication** ReadyCell & UB	**WP leaders**
12:20	**Ethics Requirements (WP 1)** Follow-up of ethical considerations	**UB-IN2UB** A Oriol.
12:30	Wrap-up, questions, comments & next steps	**All**
12:40	End of the meeting	

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1.2 Meeting Minutes

Prof. Dr Albert Romano (AR) welcomes the attendees to the meeting and asks for permission to record the session for internal use only. This action is unanimously approved.

The agenda to be followed is accepted and AR provides an overview of the status of the project: (i) simulations of nanopillars have been carried out in the frame of WP2, (ii) the first steps to designing a meaningful fabrication strategy of nanopillars is ongoing (WP3), (iii) first tests on living tissues are completed (WP4), and (iv) the design of gratings is being evaluated (WP5).

AR identifies as the main challenge the work to be done in the coming months before RP1. As far as dissemination and exploitation are concerned, concrete objectives and KPIs need to be decided well in advance.

AR proposes Copenhagen as the best venue for the next meeting if the EC services do not ask for an alternative location. This is unanimously approved. AR comments that the PO is being changed again but no further information is available at the moment.

The project manager (Francisco Hernández, FH) overviews the deliverables submitted to the EC so far, which are available through both the Participant Portal and the project intranet. A final decision on their acceptance is not expected before the RP1 meeting.

FH reports that no ethical or privacy issues have been identified. FH also reminds the Consortium that Data Inventory reported in the deliverable D7.2 must be kept updated. To that end, a shared database (EXCEL spreadsheet) will be available in the project intranet so that partners can provide their inputs on a regular basis. FH gathers the final acceptance to publish "Public" deliverables in ZENODO.

FH overviews the coming deliverables and the reporting calendar to be followed before RP1. The impact of the summer period is identified as a risk which makes necessary the close coordination of partners to meet the next deadlines. Finally, FH reminds that 6-month financial and effort follow-up is necessary to early identify deviations and apply corrective actions, if necessary.

Prof. Winnie Svendsen (WS) (DTU) overviews in collaboration with Dr Christian Bertelsen (CB) (DTU), Dr Maria Dimaki (MD) (DTU) and Dr Radu Malureanu (RM) (DTU) the WP3 objectives, workplan and the coming deliverables. Going into tasks details, the experimental set-ups, initial process ideas as well as the new team members who will join the project in the coming weeks are briefly presented. In the frame of WP3, a physical meeting in Copenhagen will take place in April to move forward with the work package implementation.

In WP4, Dr Noemi de Luna (NdL) (LEITAT) and Prof. Florenci Serras (FS) (UB) overview the initial tests carried out in the frame of the work package. The tissue-nanopillar material biocompatibility of different surface materials has been preliminarily tested by using different coating approaches and biomaterials (cells). So far, no significant differences in the adherence of cells are reported. FS shows promising results of S2 cells cultured on substrates and drosophila imagined discs incubated on substrates.

Jens Goldschmidt (JG) (ALU-FR) reviews the objectives of WP5 and presents the work done so far. Simulations of optical gating couplers have been carried out to estimate the potential losses.

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The next work will focus on experimental measurements with meaningful conditions. Scientific and technical discussion is established between some partners.

Dr Daniel Navarro (DN) (UB), as WP2 leader, briefly reviews the main conclusions of the already-submitted deliverable D2.1, which has been the first technical report submitted in the frame of the project implementation. To achieve the desired 10 nm deformation during the proposed device operations, pillars of height 1 micron and radii 50 nm are found to be good enough to attain the project objectives. DN overviews the next steps to be done in the frame of the work package, paying attention to the deliverable D2.2 whose deadline is May 31st.

In WP8, Pol Romano (PR) (UB) reviews the dissemination actions to be carried out in the next months (e.g., leaflet, roll-up, videos…). PR shows the Consortium the practical operation of the project SharePoint, which will be used as a document repository from now on. The new logo and the standard templates (presentations & deliverables) are also presented. PR asks for active involvement from partners to enrich the project website and other dissemination tools (e.g., photos and testimonial videos). New open positions will be published on the StretchBio website. A template to define dissemination and communication metrics and KPIs will be shared with partners to create a clear picture of what we can achieve before RP1. AR indicates that partners must increase the activity levels in the coming months in order to accommodate outputs to the EC expectations. Àlex Estivill (AE) (ReadyCell) briefly discusses the importance of working on exploitation despite we are all aware that the project and the achieved results are still in their infancy. AE provides an overview of the methodology to be followed from now on to early identify exploitation opportunities, which will be further elaborated and presented in the deliverable D8.2 at M12.

Albert Oriol (AO), the external ethical advisor appointed by the consortium, presents in the frame of WP1 his feelings on the project status and summarizes the content of the submitted deliverables. The project does not entail any significant risk from an ethical point of view, despite he will continuously monitor the project implementation, in particular as early as the ex-vivo human tissues are used in WP6 (expected in Q3 2022).

AR wraps up the meeting's main outputs and together with FH and the partners envisages a meaningful schedule to cope with the RP1 commitments. Contributions from partners should be submitted to the coordinator no later than mid-August for a final quality check. The review meeting is expected to happen during the second week of September (5th to 9th) unless the PO decides otherwise.

Full details on the work packages overviews are given in the attached slides (Annex II).

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Annex 1 – Attendance List

Attendance list to the second StretchBio meeting has been done using the Teams' attendance tools. The e-file with the audit trail is available upon request.

Attendant	Institution
Goldschmidt, Jens	ALU-FR
Schmitt, Katrin	ALU-FR
Andrei Laurynenka	DTU
Maria Dimaki	DTU
Radu Malureanu	DTU
Winnie Edith Svendsen	DTU
Christian Vinther Bertelsen	DTU
ORIOL ROCAFIGUERA, ALBERT	External Ethical Advisor
Noemi De Luna Salvà	LEITAT
Imma Prats Morilla	LEITAT
Alex Estivill Cabré	ReadyCell
Marta Ollé Monge	ReadyCell
Monica Viaplana Gaig	ReadyCell
Sheila Guisado Baquero	ReadyCell
Albert Romano Rodríguez	UB
Cristiano Piergallini	UB
Daniel Navarro Urrios	UB
Florencio Serras Rigalt	UB
Francisco Hernández	UB
Jordi Alcaraz	UB
Mauricio Moreno Sereno	UB
Pol Romano de Gea	UB
Sergi Hernández	UB
Juliana Jaramillo	UB
Natalia Díaz-Valdivia	UB

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Annex 2 – Presentations - Slides

Presentations (slides) shown by the participants to the StretchBio 6-month meeting. Information identified as potentially confidential or critical has been eliminated.

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Overview and project implementation at M6

Albert Romano-Rodriguez

Outline

- Approval of the agenda
- Project overview – time line
- Activities carried out (M1 – M6)
- Activities for the next 6-month period (M7 – M12)
- Next meeting

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Approval of the agenda

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09:40	**EC Guidelines**	**EC-PO**
09:50	**StretchBio project** - Project implementation at M6 (overview)	**UB-IN2UB** A Romano.
10:10	**The Work Packages in detail** - WP7: **Project management** - UB	**WP leaders**
10:30	Coffee break	
10:40	- WP3: **Fabrication and characterisation of the nanosensor** - DTU - WP4: **Tissue-nanopillar material compatibility** - LEITAT - WP5: **Integration of light sources and detectors** - ALU-FR - WP2: **Design and modelling of photonic crystals** - UB - WP8: **Exploitation, dissemination, training and communication** - ReadyCell & UB	**WP leaders**
12:20	**Ethics Requirements (WP 1)** Follow-up of ethical considerations	**UB-IN2UB** A Oriol.
12:30	Wrap-up, questions, comments & next steps	**All**
12:40	End of the meeting	

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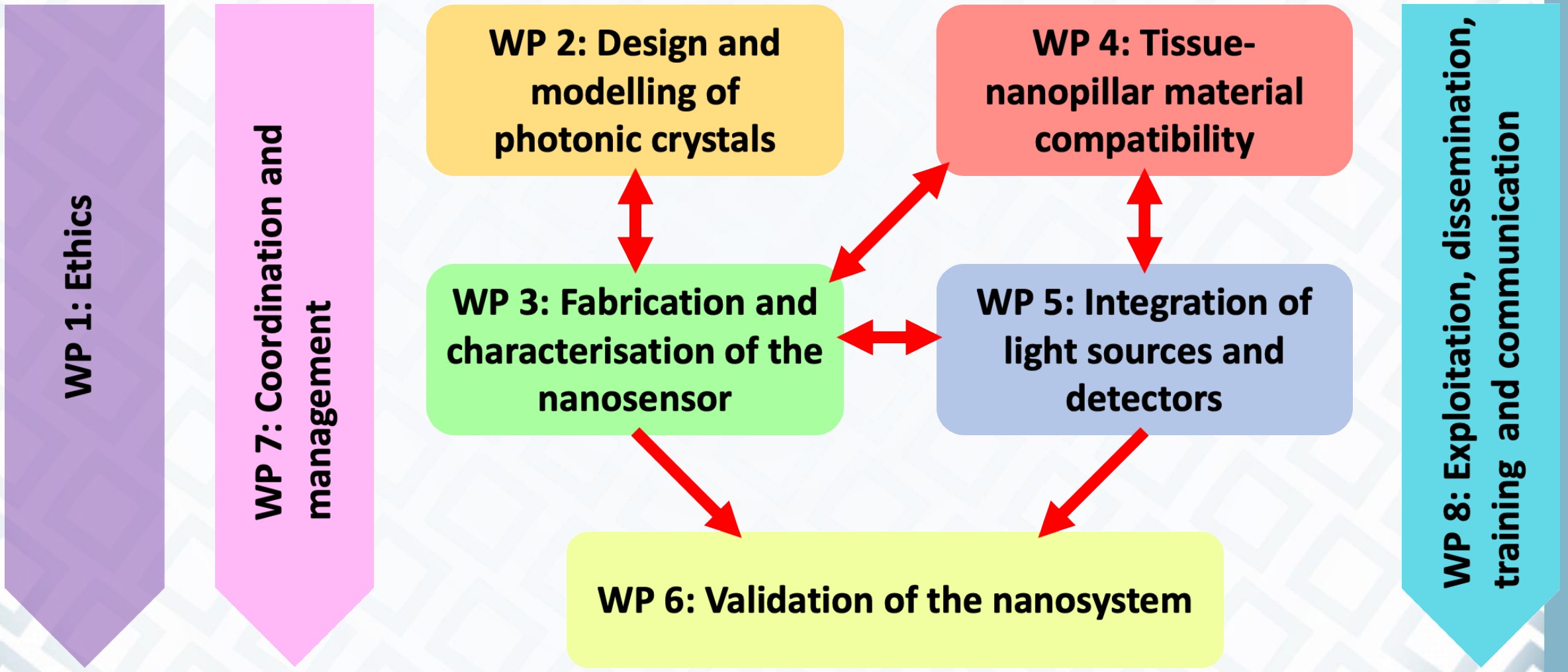
Project overview



Project overview – time line

Work packages, tasks, deliverables and milestones		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1	**Ethics requirements**	D1.1 D1.6															
WP2	**Design and modelling of photonic crystals (UB)**																
	T2.1: Simulation/modelling of the deformation		D2.1														
	T2.2: Modelling of light transmission			D2.2													
	T2.3: Study of the effect of nanopillar deformation					D2.3	M2				D2.4						
WP3	**Fabrication and test of the nanosensor (DTU)**																
	T3.1: Fabrication of nanopillars			D3.1	M1												
	T3.2: Measurement of the bending-force relation				D3.2												
	T3.3: Light transmission through the nanopillar array					D3.3	M3										
	T3.4: Light transmission changes upon bending							D3.4									
	T3.5: Surface modification of the nanopillars									D3.5	M6						
WP4	**Tissue-material compatibility (LEITAT)**																
	T4.1: Living tissue-nanopillar biocompatibility				D4.1												
	T4.2: Study of the adhesion of tissue-nanopillar							D4.2	M4								
	T4.3: Other issues affecting light propagation								D4.3								
WP5	**Integration of light sources and detectors (ALU)**																
	T5.1: Design of grating for light coupling				D5.1												
	T5.2: Miniaturised photodetectors						D5.2										
	T5.3: Design of optical components for light splitting																
	T5.4: Design/implementation of source and detection									D5.3	M7						

Project overview – time line

Work packages, tasks, deliverables and milestones		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP6	**Validation of the nanosystem (UB)**																
	T6.1: Proof of concept							D6.1	M5								
	T6.2: Experiments on ex vivo tissues									D6.2	M8	D6.3		D6.4	M12		
	T6.3: System integration														D6.5		
WP7	**Coordination and management (UB)**																
	T7.1: Consortium meetings	D7.1															
	T7.2: Project monitoring and risk management																
	T7.3: Production of internal and official reports			D7.3		D7.4		D7.5		D7.6		D7.7		D7.8		D7.9	D7.10
	T7.4: Maintenance of project document database		D7.2														
WP8	**Exploitation, dissemination and training (RCELL)**																
	T8.1: Patent database and exploitation plan	D8.1			D8.2								D8.5	M11			
	T8.2: Planning scientific publications and conferences									D8.3	M9						
	T8.3: Workshops, training and short term-missions									D8.3	M9						
	T8.4: Communication and outreach										D8.4	M10					

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Activities carried out (M1 – M6)

- Simulation of nanopillar deformation upon force application (WP2) (1 online meeting)
- Simulation of light transmission through nanopillar array (WP2)
- Fabrication of nanopillars and nanostructures (WP3) (2 online meetings)
- Living tissue – silicon (nanopillars) compatibility, using both cells and tissues and different types of substrates with several treatments, with and without nanopillars (WP4) (1 online and 1 physical meeting)
- Design of gratings for different wavelengths and incidence angles (WP5)

Activities carried out (M1 – M6)

- Set-up of the webpage of the project (www.stretchbio.eu)
- Common sharepoint space for the project (to be discussed later)

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Activities for the next 6-month period (M7 – M12)

Work packages, tasks, deliverables and milestones		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1	**Ethics requirements**	D1.1 D1.6															
WP2	**Design and modelling of photonic crystals (UB)**																
	T2.1: Simulation/modelling of the deformation		D2.1														
	T2.2: Modelling of light transmission			D2.2													
	T2.3: Study of the effect of nanopillar deformation					D2.3	M2				D2.4						
WP3	**Fabrication and test of the nanosensor (DTU)**																
	T3.1: Fabrication of nanopillars			D3.1	M1												
	T3.2: Measurement of the bending-force relation				D3.2												
	T3.3: Light transmission through the nanopillar array					D3.3	M3										
	T3.4: Light transmission changes upon bending							D3.4									
	T3.5: Surface modification of the nanopillars									D3.5	M6						
WP4	**Tissue-material compatibility (LEITAT)**																
	T4.1: Living tissue-nanopillar biocompatibility				D4.1												
	T4.2: Study of the adhesion of tissue-nanopillar							D4.2	M4								
	T4.3: Other issues affecting light propagation								D4.3								
WP5	**Integration of light sources and detectors (ALU)**																
	T5.1: Design of grating for light coupling				D5.1												
	T5.2: Miniaturised photodetectors						D5.2										
	T5.3: Design of optical components for light splitting																
	T5.4: Design/implementation of source and detection									D5.3	M7						

Activities for the next 6-month period (M7 – M12)

Work packages, tasks, deliverables and milestones		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP6	**Validation of the nanosystem (UB)**																
	T6.1: Proof of concept							D6.1	M5								
	T6.2: Experiments on ex vivo tissues									D6.2	M8	D6.3		D6.4	M12		
	T6.3: System integration														D6.5		
WP7	**Coordination and management (UB)**																
	T7.1: Consortium meetings	D7.1															
	T7.2: Project monitoring and risk management																
	T7.3: Production of internal and official reports			D7.3		D7.4		D7.5		D7.6		D7.7		D7.8		D7.9	D7.10
	T7.4: Maintenance of project document database		D7.2														
WP8	**Exploitation, dissemination and training (RCELL)**																
	T8.1: Patent database and exploitation plan	D8.1			D8.2								D8.5	M11			
	T8.2: Planning scientific publications and conferences									D8.3	M9						
	T8.3: Workshops, training and short term-missions									D8.3	M9						
	T8.4: Communication and outreach										D8.4	M10					

Activities for the next 6-month period (M7 – M12)

- T2.1 Simulation of nanopillar deformation upon force application
- T2.2 Simulation of light transmission through nanopillar array (D2.2)
- T2.3 Effect of nanopillar deformation
- T3.1 Fabrication of nanopillars and nanostructures (D3.1) (M1)
- T3.2 Measurement of force-bending of nanopillars (D3.2)
- T3.3 Light transmission through the undeformed nanopillar array
- T4.1 Living tissue-nanopillar biocompatibility (D4.1)
- T4.2 Adhesion of tissue-nanopillar
- T4.3 Other issues of tissue-nanopillar interaction
- T5.1 Design of gratings (D5.1)
- T5.2 Miniaturised photodetectors
- T5.3 Components for light splitting

Activities for the next 6-month period (M7 – M12)

- T6.1 Proof of concept
- We have to define strategy on:
  - Dissemination of the project
  - Preparation of dissemination and outreach materials
  - Establishing KPI

Outline

- Approval of the agenda
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Next meeting

- Forecasted for month 13 (September 2022)
- Meeting with the PO and the scientific reviewers
- Possible location: Copenhagen (or Brussels, if requested by PO)?
- Complete scientific and financial review

WP7-Project Management

Outline

- Project overview – reporting status
- Next reporting tasks (M6 – M12)
- Periodic Report
- Financial follow-up

Outline

- Project overview – reporting status
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- Periodic Report
- Financial follow-up

Project overview – reporting status

- 7 deliverables (1 technical – D2.1) generated and submitted through the PC
- EC decision on the final acceptance after the First Reporting Period (M12)
- Deliverables available at the Project intranet:

WP No	Del Re	Del No	Title	Description	Leac	Nature	Dissem	Est. Del.	Rev. Due	Receipt I	Approval D	Status	
WP1	D1.1	D1	H - Requirement No.	It is not clear from the proposal whether the p...	UB	Ethics	Confic	30 Sep 2		28 Oct 2		Submitte	
WP1	D1.2	D2	POPD - Requirement	If the project involves human participants and/...	UB	Ethics	Confic	30 Sep 2		28 Oct 2		Submitte	
WP1	D1.3	D3	OEI - Requirement Nc	An Independant Ethics Advisor must submit a rep...	UB	Ethics	Confic	30 Sep 2		28 Oct 2		Submitte	
WP2	D2.1	D4	Report on relation de	The report will present the results of the simu...	UB	Repor	Public	28 Feb 2		06 Mar 2		Submitte	
WP7	D7.1	D24	Kick-off meeting	Kick-off meeting of the project	UB	Repor	Public	30 Sep 2		28 Oct 2		Submitte	
WP7	D7.2	D25	Data management pl	Data management plan	UB	ORDP	Public	28 Feb 2		28 Feb 2		Submitte	
WP8	D8.1	D34	Website	Web domain acquired and initial set-up	Rea	Websi	Public	30 Sep 2		28 Oct 2		Submitte	

Project overview – reporting status

- Ethical deliverables do not anticipate any problem related to privacy or data protection aspects

- (first draft) Data management plan presented in D7.2 – to be enriched by partners when new data and datasets are available (template in intranet)

- Deliverables labelled as “Public” will be released at Zenodo and project website every six months

Outline

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- Financial follow-up

Upcoming reporting tasks

- Hectic activity in the coming months (7 deliverables in 6 months)
- Public deliverables: “confidential information” as annexes
- Plan to accommodate “August-Deliverables” to the holiday period

WP No	Del Rel. No	Title	Lead Beneficiary	Nature	Dissemination Level	Est. Del. Date (annex I)
WP7	D7.3	Report on the 1st intermediate Project meeting	UB	Report	Public	31 Mar 2022
WP2	D2.2	Report on photonic device based on nanopillar geometry	UB	Report	Confidential	31 May 2022
WP3	D3.1	Guidelines for optimised semiconductor fabrication route	DTU	Report	Public	31 May 2022
WP3	D3.2	Report on the bending-force relation in nanopillars	DTU	Report	Public	31 Aug 2022
WP4	D4.1	Report on the nanopillar biocompatibility	LEITAT	Report	Public	31 Aug 2022
WP5	D5.1	Report on the design and fabrication issues of the optical grating	ALU-FR	Report	Public	31 Aug 2022
WP8	D8.2	Dissemination and exploitation plan	ReadyCell	Report	Public	31 Aug 2022

Outline

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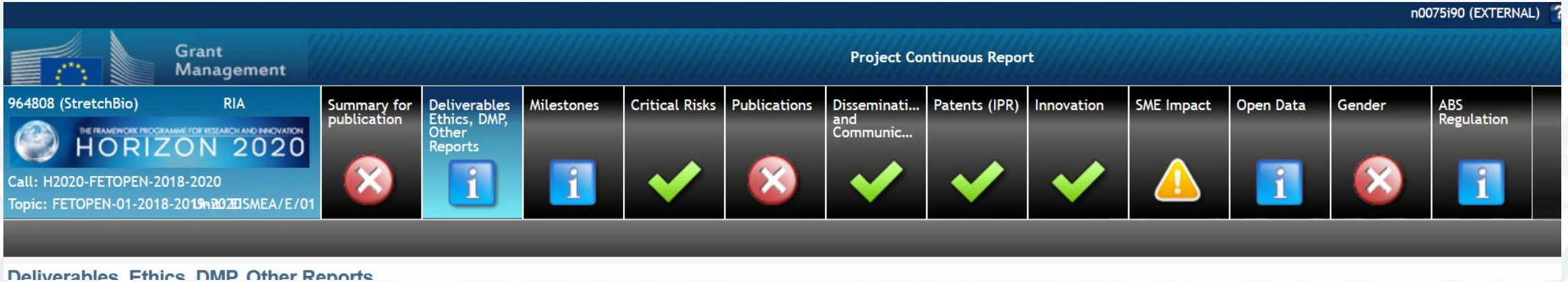
- Periodic Report
- Financial follow-up

Periodic Report

- RP1 covers from M1 to M12
- Technical report (D7.4) due to 30th September 2022
- Financial report up to 30th October 2020 (final figures) – first draft mandatory in September
- Review meeting presumably along September – PO and reviewers will ask a periodic report draft 15 days before.
- Set up a plan to gather contributions from July to early September

Periodic Report



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- Financial follow-up

Financial Follow-up

- Any large deviations reported by StretchBio partners (effort & budget)
- UB financial services distributed follow-up Excel:
  - Six-monthly basis (Consortium Agreement)
  - 6M – only estimate figures are required to early identify any problem
- Remember to inform us if you want to change your budget or transfer with another partner

6 month status meeting – April 2022

WP3 status

Participants from DTU

DTU Bioengineering
Department of Biotechnology and Biomedicine

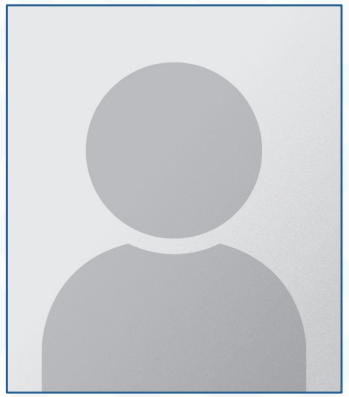
Winnie Svendsen
Professor

Maria Dimaki
Senior Researcher

Christian Bertelsen
Postdoc

Elena Lopez
Research assistent

Erkan Karatas
Student Assistent

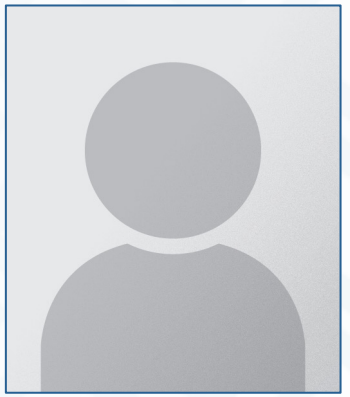


Open position
PhD student (August 2022)

DTU Fotonik
Department of Photonics Engineering

Andrei Laurynenka
Associate Professor

Radu Malureanu
Senior Researcher



Rodrigo Sato
Postdoc (May-June 2022)

Work package 3

Fabrication and characterization of the nanosensor

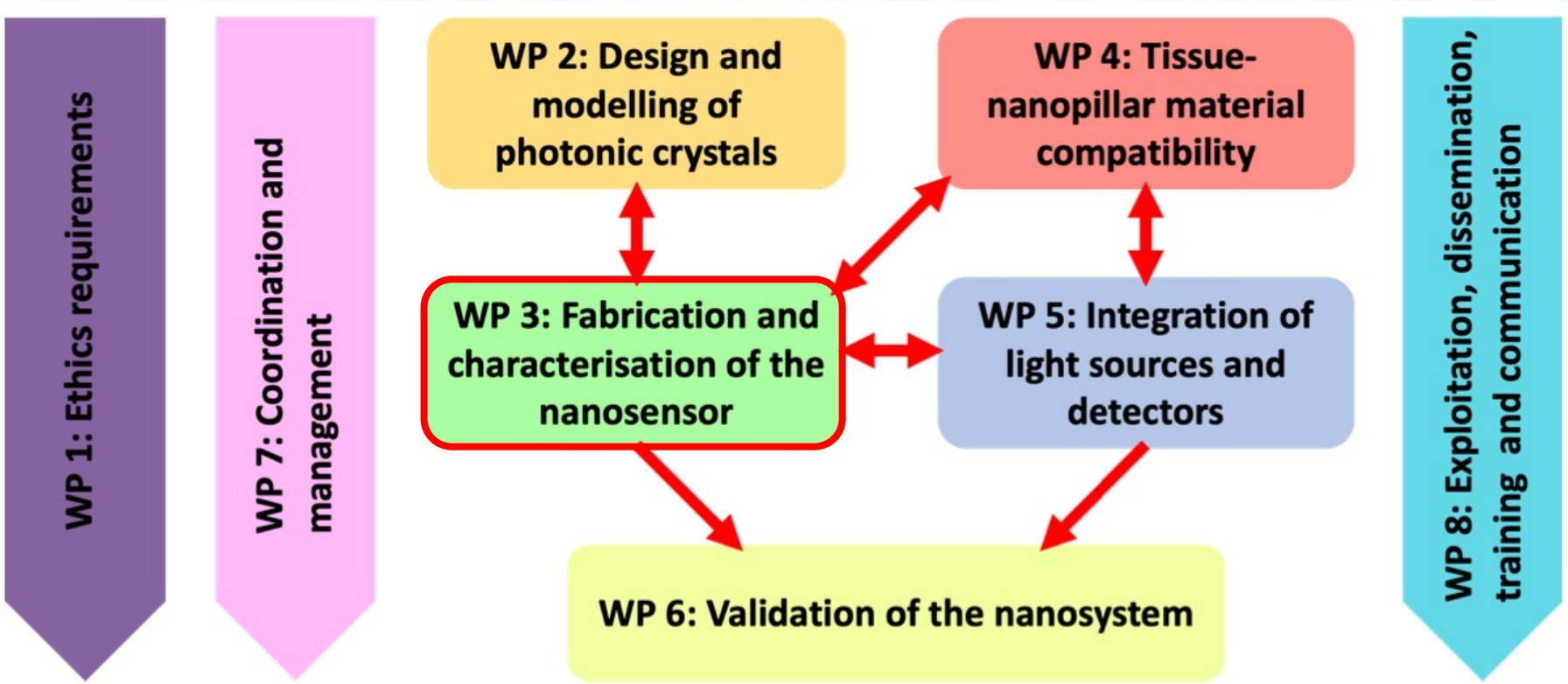
Work packages, tasks, deliverables and milestones		Year 1				Year 2				Year 3				Year 4			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP3	**Fabrication and test of the nanosensor**																
	Task 3.1: Fabrication of nanopillars			**D3.1**	**M1**												
	Task 3.2: Measurement of the bending-force relation				**D3.2**												
	Task 3.3: Light transmission through the nanopillar array					**D3.3**	**M3**										
	Task 3.4: Light transmission changes of an individual photonic nanosensor upon bending							**D3.4**									
	Task 3.5: Surface modification of the nanopillars									**D3.5**	**M6**						

Objectives:

- **Fabrication** of nanopillar arrays and photonic nanosensors
- Experimental **characterization** of the photonic crystal, both in absence and presence of nanopillar deflection
- Nanopillars' **surface modification** for tuning tissue adhesion will be studied
- **Continuous fabrication** of nanopillar arrays for the other WPs

Work package 3

Fabrication and characterization of the nanosensor



Work package 3

Fabrication and characterization of the nanosensor

Task 3.1: Fabrication of nanopillars
- UBA: 4, DTU: 12, ALU-FR: 3
- M1-M45

Task 3.2: Measurement of the bending-force relation
- UBA: 6, DTU: 4
- M4-M18

Task 3.3: Light guiding through the nanopillar array
- UBA: 3, DTU: 6, ALU-FR: 2
- M7-M30

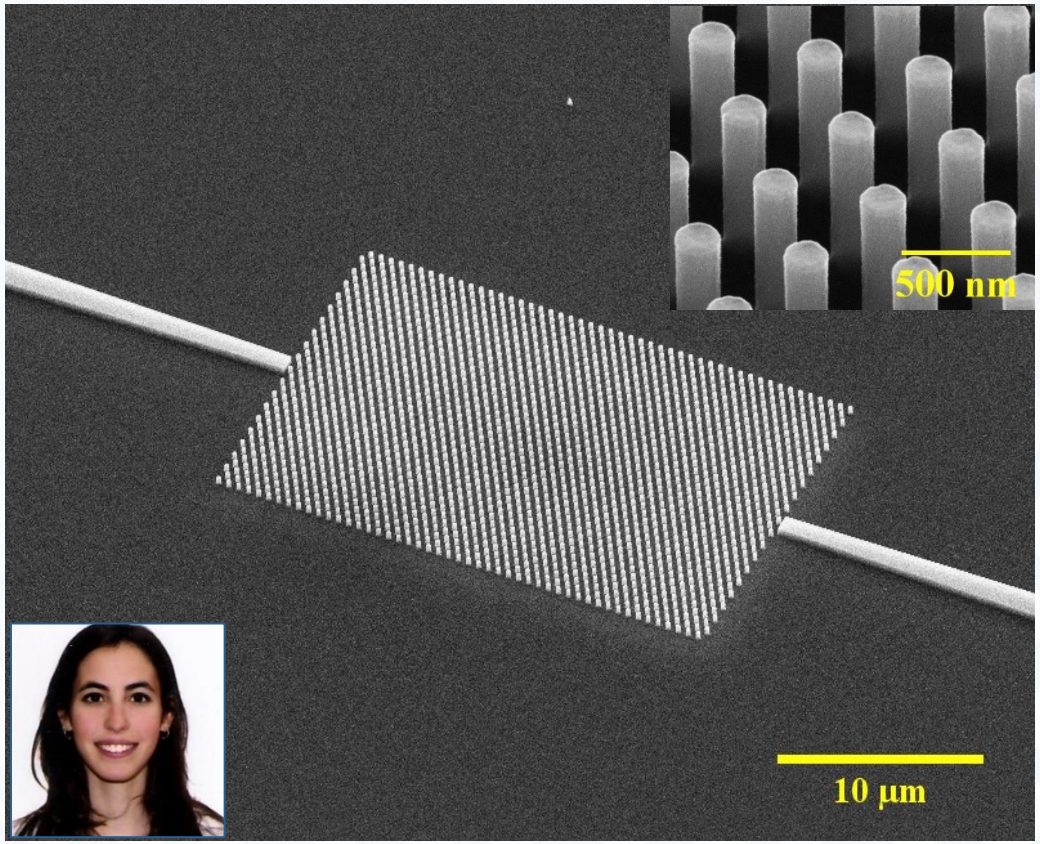
Task 3.4: Light guiding changes of an individual photonic nanosensor upon bending
- UBA: 7, DTU: 8, ALU- FR: 3
- M13-M36

Task 3.5: Surface modification of the nanopillars
- UBA: 3, DTU: 5; ALU-FR: 2, LEITAT: 4, RCELL: 6
- M10-M36

Task 3.1: Fabrication of nanopillars

M1-M45, UBA: 4, DTU: 12, ALU-FR: 3

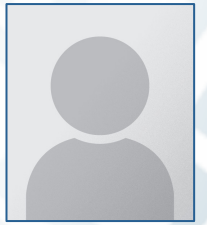
- **Fabrication** of the nanopillars at DTU **cleanroom** facilities (DTU Nanolab)
- **Initial fabrication** process of pillars is **established**
- **Changes** to the fabrication based on **characterization experiments** (mechanical, photonics, bio-compatibility)
- **Supply** of nanosensors and structures to other WPs



Christian Bertelsen
Postdoc

Erkan Karatas
Student Assistent

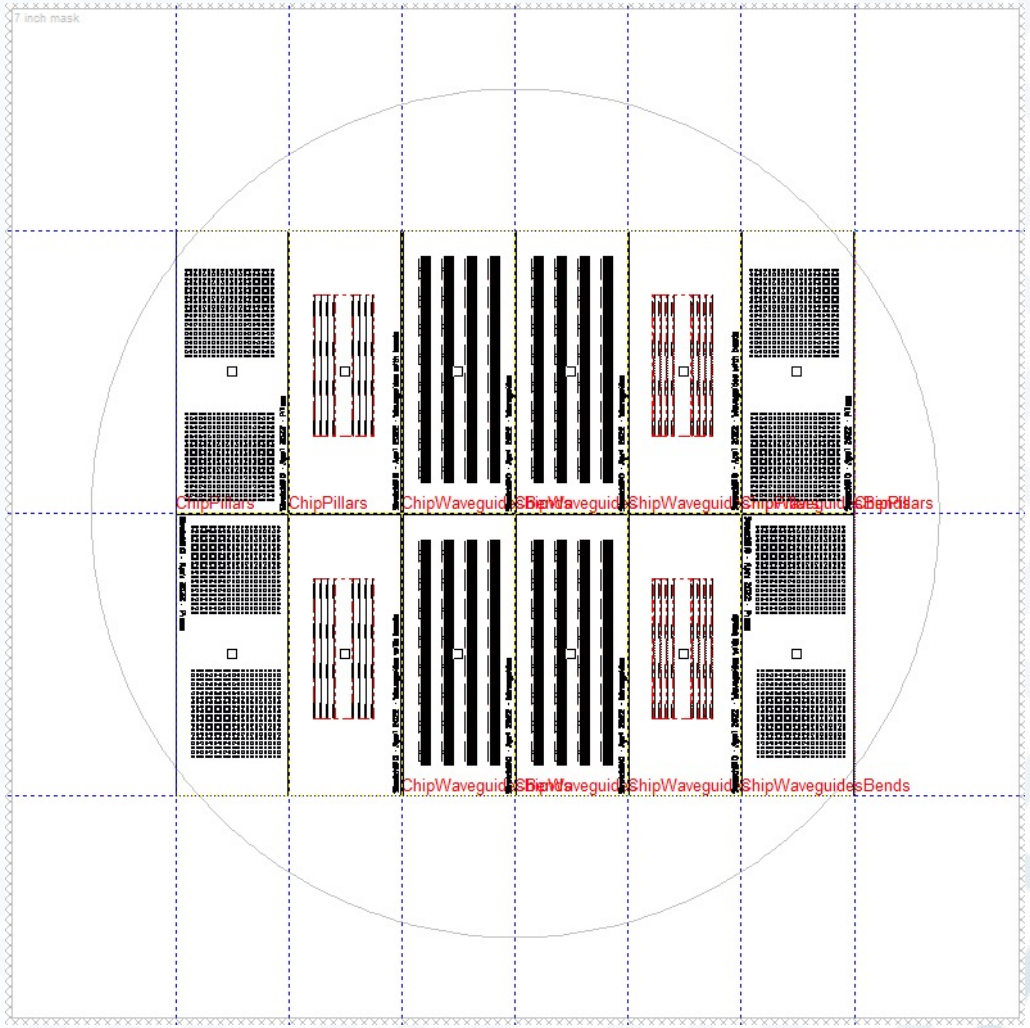
Elena Lopez
Research Assistent



Unknown
PhD student (August)

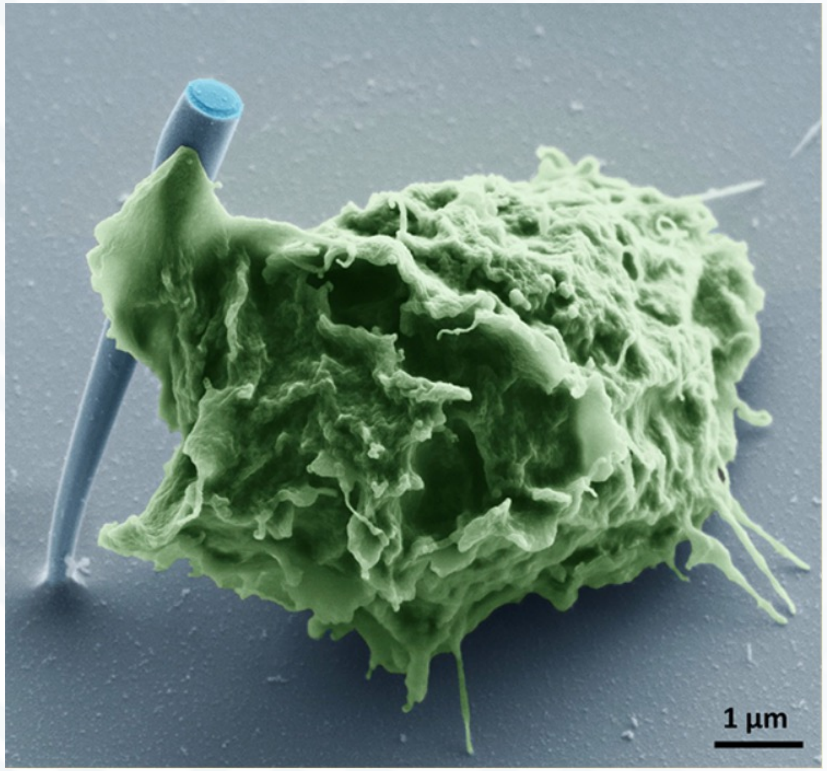
Task 3.1: Fabrication of nanopillars

- Planning:
  - Discussion about biocompatibility (December)
  - Waveguide fabrication (March)
  - Pillar structures for wettability (March)
- Process development:
  - Testing the established process
  - Optimizing time
  - Looking into feasibility
- Upcoming D3.1: On track!



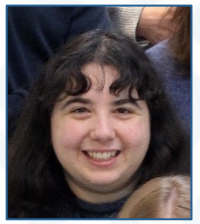
Task 3.2: Measurement of the bending force relation

M4-M18, UBA: 6, DTU: 4



P. Paulitschke et al., "Ultraflexible Nanowire Array for Label- and Distortion-Free Cellular Force Tracking," Nano Lett., vol. 19, no. 4, pp. 2207–2214, Apr. 2019, doi: 10.1021/acs.nanolett.8b02568.

- **Mechanical characterization** of the nanopillars in different environments
- Single **nanopillar bending**, e.g. using **AFM**
- **Resonance** frequency experiments to **validate** theoretical **model**
- Frequent **back-and-forth** comparisons with simulations in **WP2**



Maria Dimaki
Senior Researcher

Christian Bertelsen
Postdoc

Task 3.2: Measurement of the bending force relation

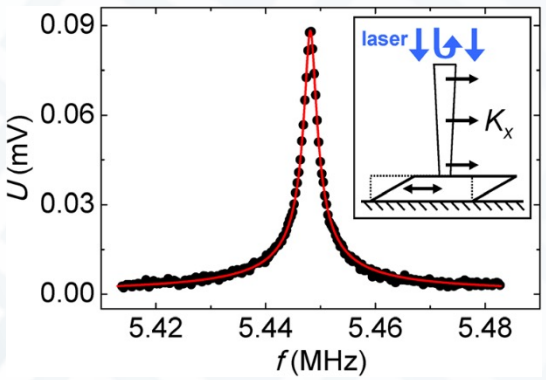
Resonance char.

Actuation:

- Piezo-element actuates the pillar array around the resonance frequency

Read-out:

- Microscope (light deflection from top)
- Laser



P. Paulitschke, N. Seltner, A. Lebedev, H. Lorenz, and E. M. Weig, "Size-independent Young's modulus of inverted conical GaAs nanowire resonators," Appl. Phys. Lett., vol. 103, no. 26, p. 261901, Dec. 2013, doi: 10.1063/1.4851897.

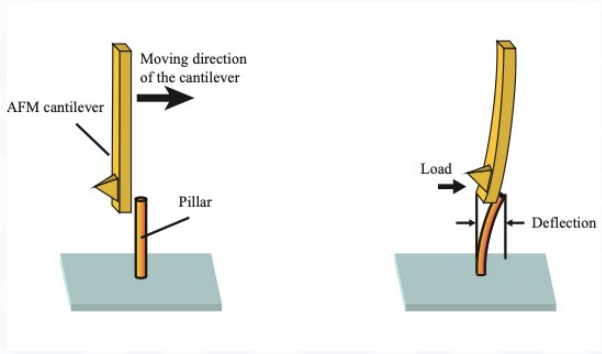
AFM deflection

Actuation:

- Deflection by AFM cantilever pushing the pillar

Read-out:

- Cantilever bending and position
- SEM



T. Takai, H. Nakao, and F. Iwata, "Three-dimensional microfabrication using local electrophoresis deposition and a laser trapping technique," Opt. Express, vol. 22, no. 23, p. 28109, Nov. 2014, doi: 10.1364/OE.22.028109.

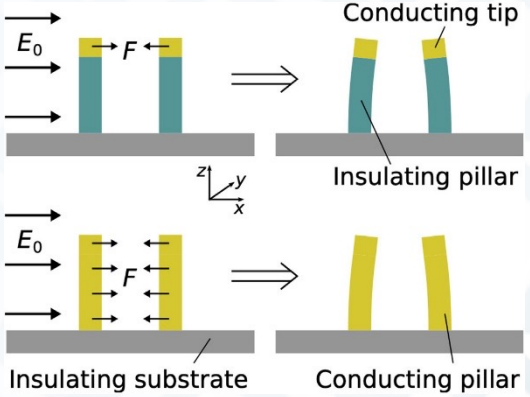
Electrostatic deflection

Actuation:

- Applied field charges the pillar which deflects due to electrostatic forces

Read-out:

- Microscope/laser
- Tranverse capacitance
- Plasmonic resonanse

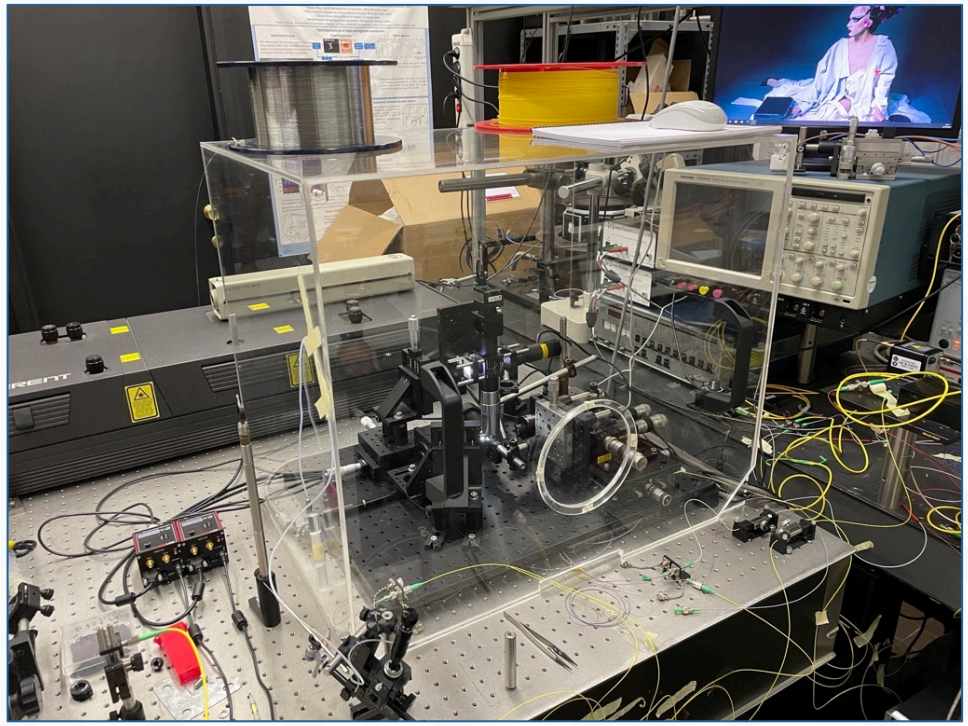


A. Kainz, R. Beigelbeck, and S. Schmid, "Modeling the Electrostatic Actuation of Nanomechanical Pillar Dimers," Front. Mech. Eng., vol. 6, p. 611590, Feb. 2021, doi: 10.3389/fmech.2020.611590.

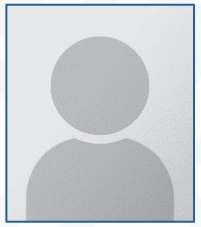
Task 3.3: Light guiding through the nanopillar array

M7-M30, UBA: 3, DTU: 6, ALU-FR: 2

- **Characterization** of the properties of the **photonic crystal** in different environments
- Comparing with results from simulations
- Aligning work between project partners



Setup in UB lab



Rodrigo Sato
Postdoc (May-June)

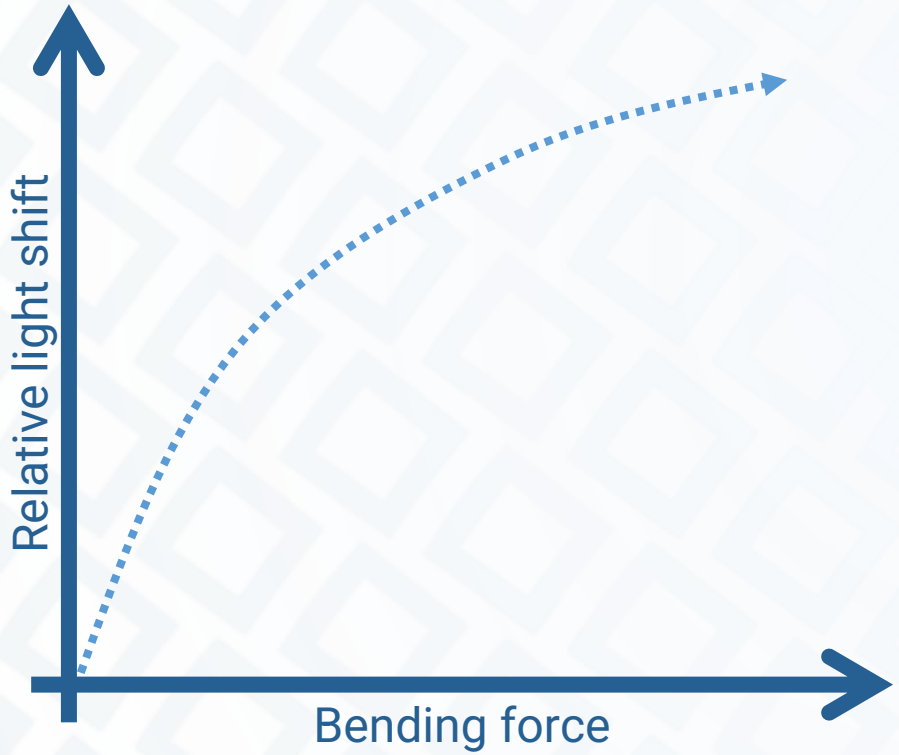
Radu Malureanu
Senior Researcher

6 month status meeting – April 2022

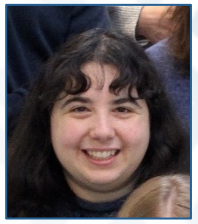
Coming up

Task 3.4: Light guiding changes of an individual photonic nanosensor upon bending

M13-M36, UBA: 7, DTU: 8, ALU- FR: 3



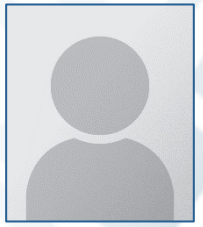
- **Combining** learnings from **task 2.2 and 2.3**
- Establish **experimental correlation** between **applied force** and **light guiding properties,** e.g. calibration curves
- Evaluate **performance** and **reproducibility** of the nanosensor



Maria Dimaki
Senior Researcher

Radu Malureanu
Senior Researcher

Christian Bertelsen
Postdoc

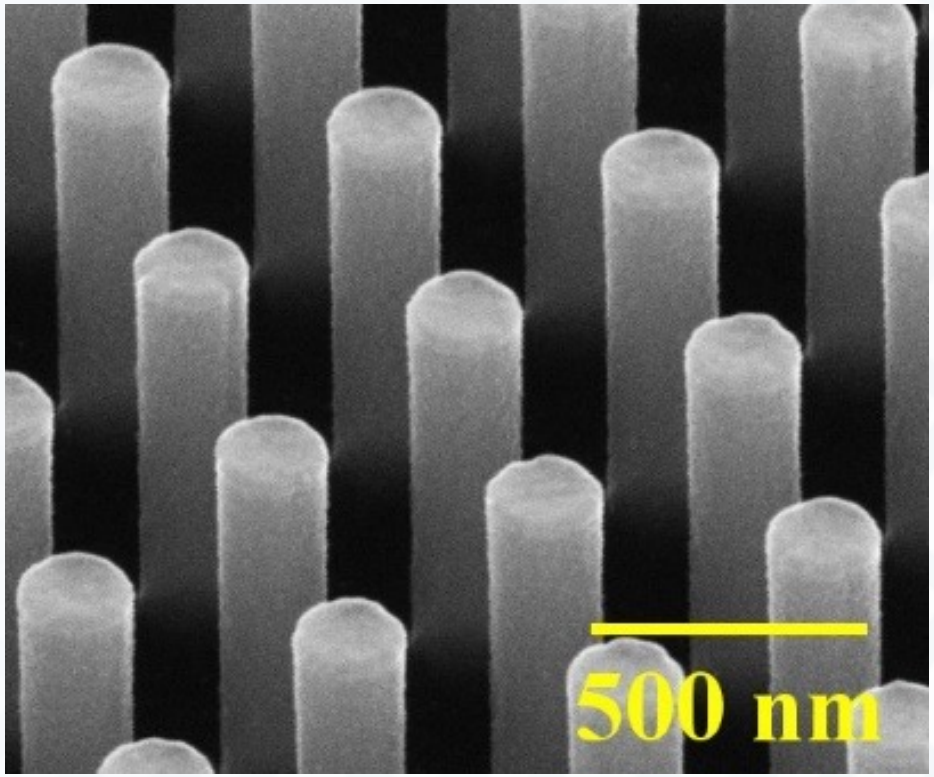


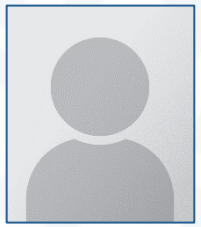
Unknown
PhD student (2022)

Task 3.5: Surface modification of the nanopillars

M10-M36, UBA: 3, DTU: 5; ALU-FR: 2, LEITAT: 4, RCELL: 6

- Post-fabrication **coverage** of nanopillars with **ultrathin layers** of biocompatible materials
- **Characterization** of surface layers
- Effects on light transmission and mechanical properties (linked to task 3.2 and 3.3)
- Close interaction with ‘WP4: Tissue-nanopillar material compatibility’





Open position
PhD student
(August 2022)

Work package 3 – Deliverables and Milestones

M3.1 →

D3.1: Guidelines for optimized semiconductor fabrication route
M9 - **June 2022**

D3.2: Report on the bending-force relation in nanopillars
M12 - **September 2022**

M3.2 →

D3.3: Prototype of photonic nanosensor based on nanopillars
M15 - **December 2022**

D3.4: Report on the photonic performance of the nanosystem
M21 - **June 2023**

M3.3 →

D3.5: Nanosensor based on nanopillars
M27 - **December 2023**


DTU

WP-4-Tissue-nanopillar material compatibility

STRETCHbio

April 1st 2022

6-Month Meeting

Tissue-nanopillar material compatibility

Surface Materials

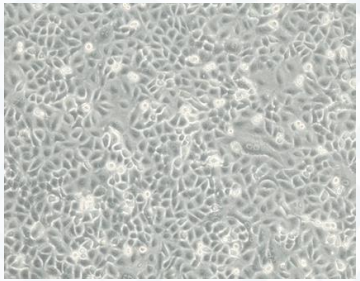
- Si n-type
- Si p-type
- Processed Si Lito+RiE
- SiO_2 968mm
- SiO_2 303.4mm

Coating

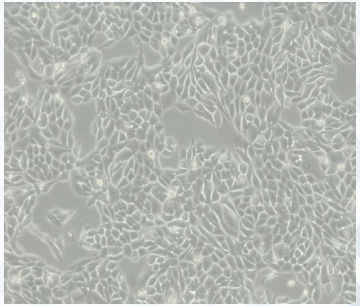
MATRIGEL
Ref: 356234
(Corning)

GELATIN
Ref: G9391 (Sigma)

Cell lines

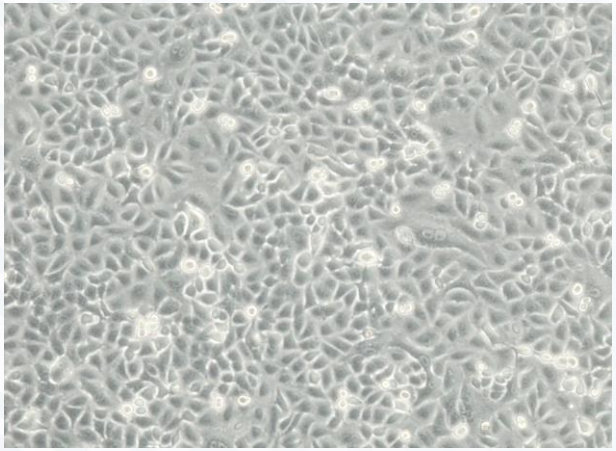


A-549



NCI-H358

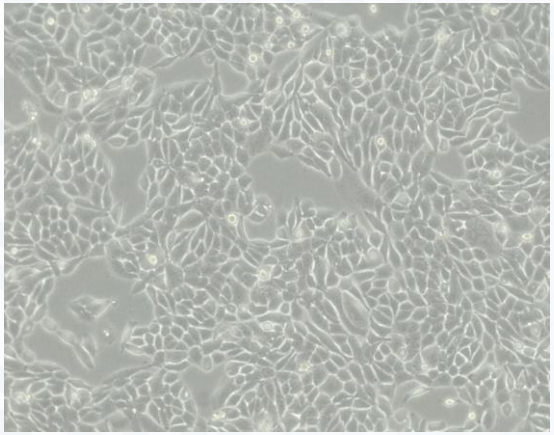
A-549



TYPE: Epithelial
DISEASE: Lung carcinoma
GROWTH: Adherent
MEDIUM: DMEM 10%FBS

A549 cells are isolated from the lung tissue of a 58-year-old Caucasian male with lung cancer.
They are adenocarcinomic human alveolar basal epithelial cells.

NCI-H358



TYPE:	Epithelial
DISEASE:	Bronquioalveolar carcinoma Non small cell lung cancer
GROWTH:	Adherent
MEDIUM:	RPMI1640 10%FBS

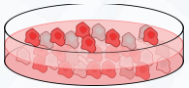
NCI-H358 cells were established from a chemotherapy-naïve non-small cell lung cancer tumor.
NCl-H358 cell line harbors a KRAS mutation.

Material and Methods

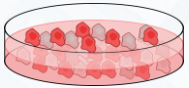
+ Inserts

- Si n-type
- Si p-type
- Processed Si Lito+RiE
- SiO_2 968mm
- SiO_2 303.4mm

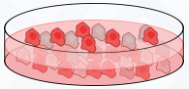
NO-COATING



MATRIGEL
dil 1/60 DMEM
Ref: 356234
(Corning)



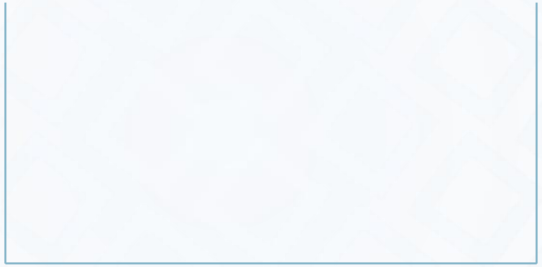
GELATIN 1%
Ref: G9391 (Sigma)



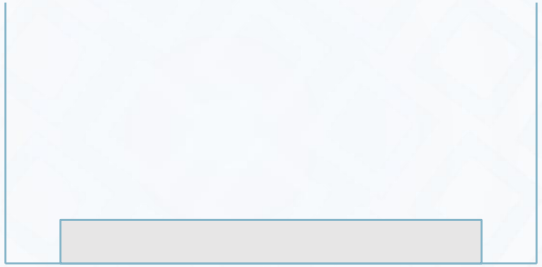
Viability assay

LIVE/DEAD™
Viability/Cytotoxicity
Assay Kit
(Green/Deep Red)
(REF: L32250 Thermo)

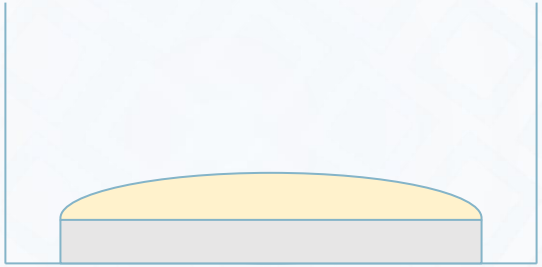
Material and Methods



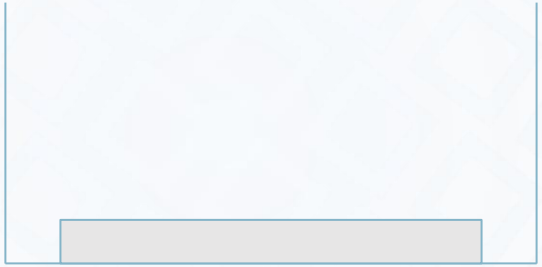
Material and Methods



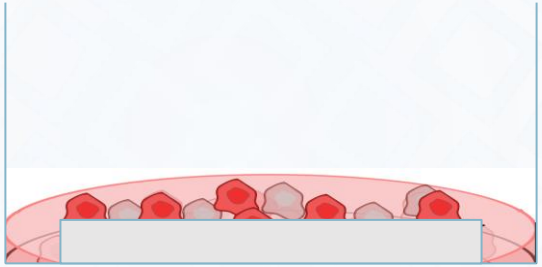
Material and Methods



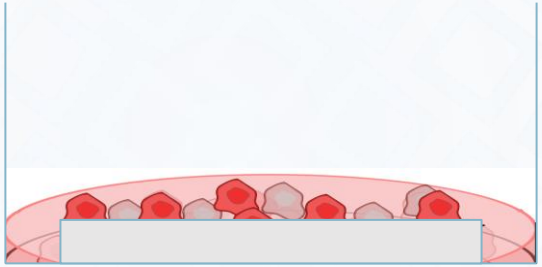
Material and Methods



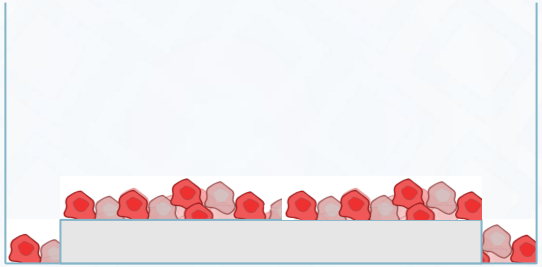
Material and Methods



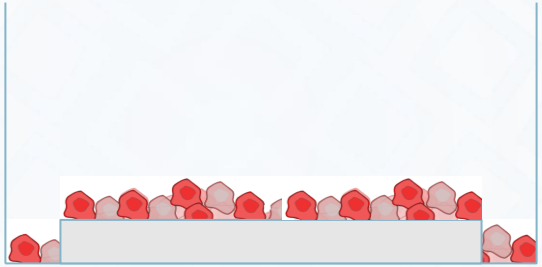
Material and Methods



Material and Methods



Material and Methods



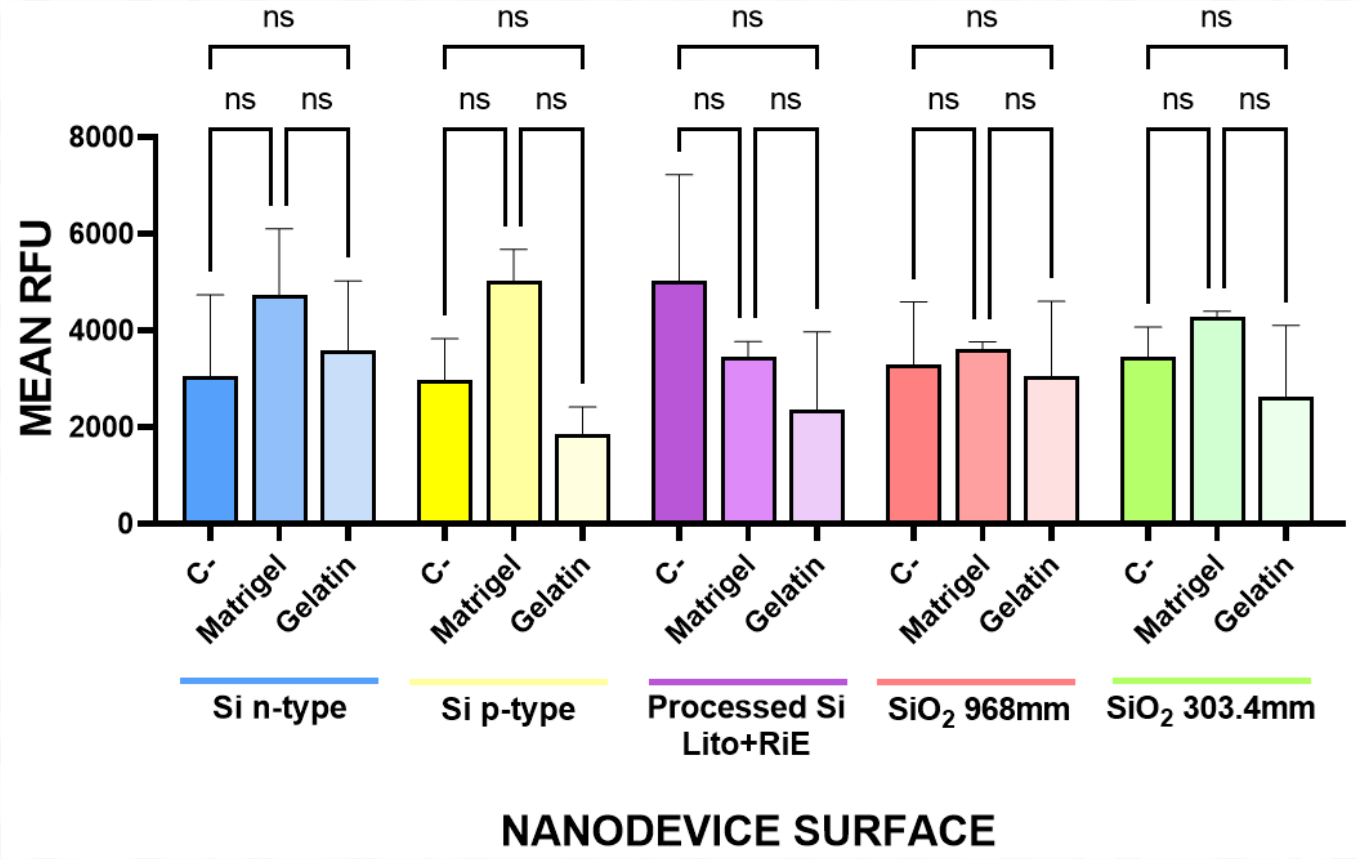
LIVE/DEAD™ Viability/Cytotoxicity Assay Kit (Green/Deep Red)
(REF: L32250 Thermo)

CYTATION 5
BIOTEK

Fluorescence intensity
Area Scanning 3x3
2000 µm separation
25 measures/point
5 mm height

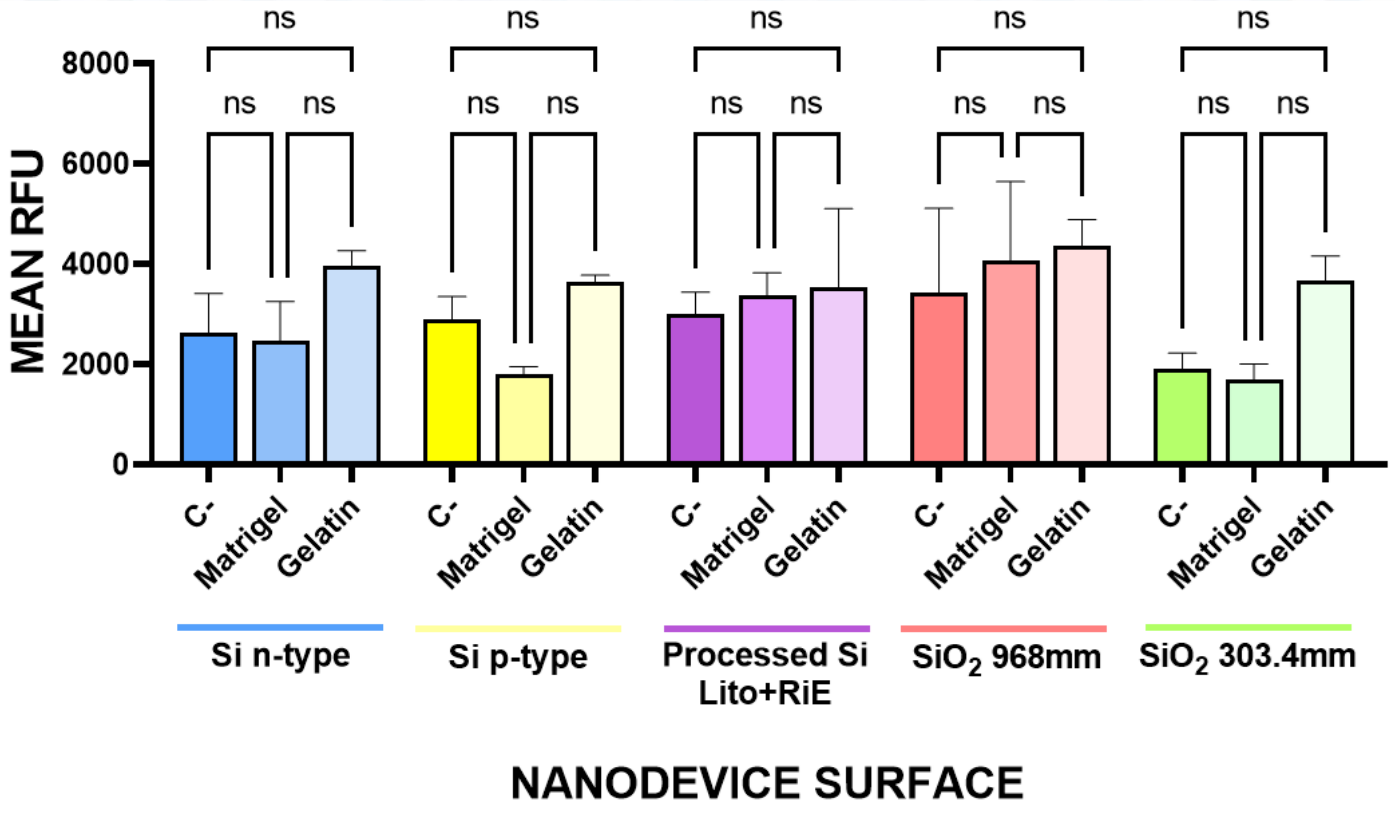
Results

A-549



Results

NCI-H358



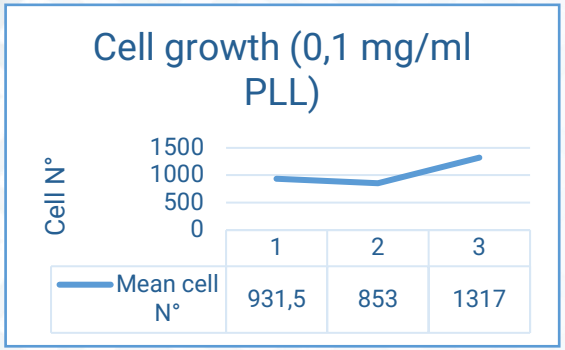
Conclusions

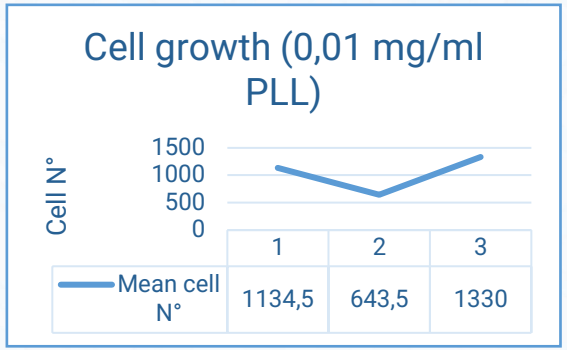
A-549 and NCl-H358 cells

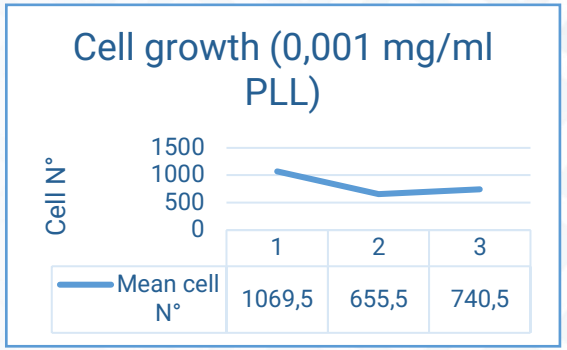
- There is no significant differences in terms of adherence between the different device nanosurfaces
- It does not seem that coating increases cell adherence in any device nanosurface.
- An increased cell death was not observed in any device nanosurface. (cell death was less than 0.01%)

S2 Cells cultured on glass

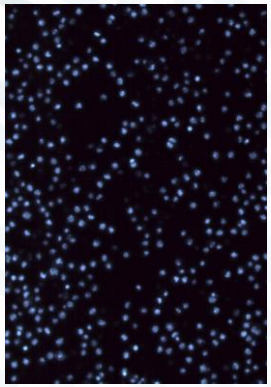
Test of Poly-L-Lysine coating and Cell Attachment



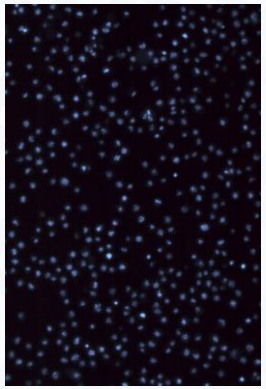




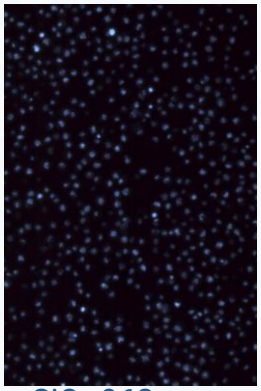
S2 Cells cultured on substrate



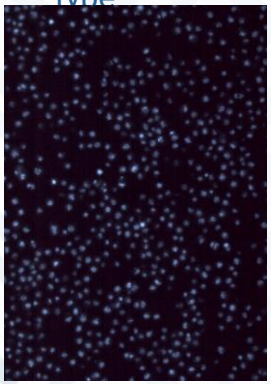
Si n-type



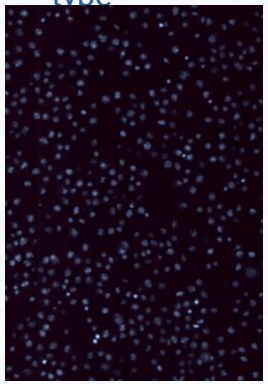
Si p-type



SiO_2 962 nm



SiO_2 303,4 nm



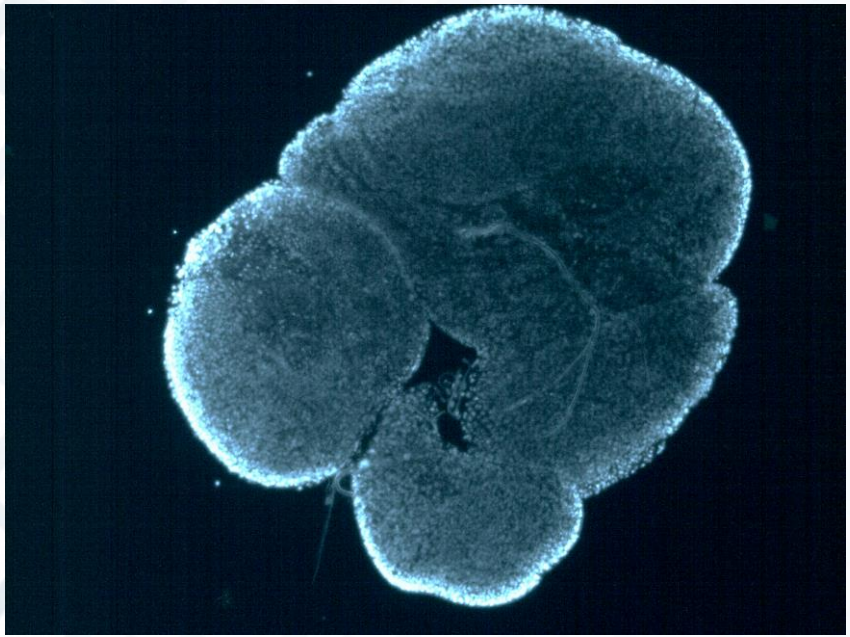
Processed Si

	Mean Cell N°
Si n-type	4086,333
Si p-type	3483
SiO_2 962 nm	3753,667
SiO_2 303,4 nm	3617
Processed Si	3301,667

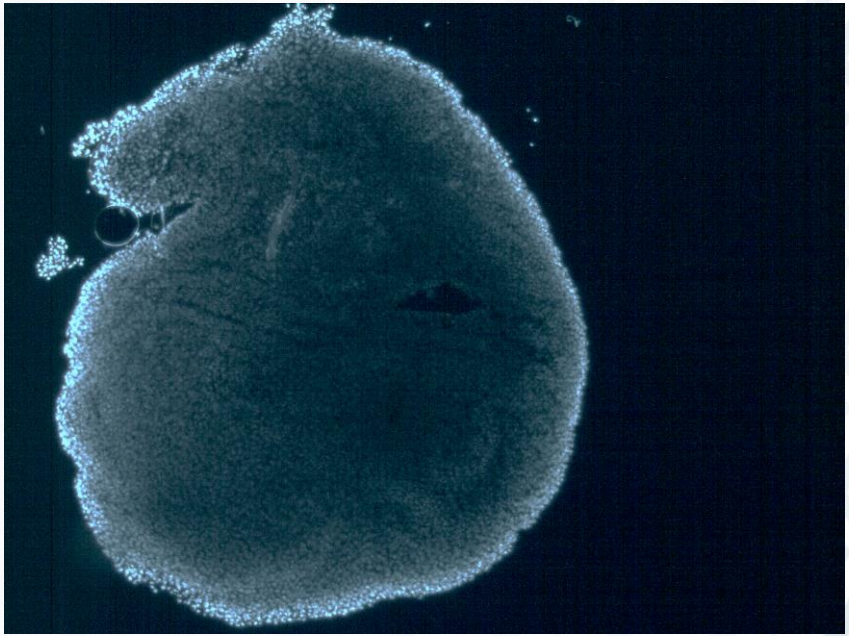
[PLL] = 0,1 mg/ml

Drosophila Imaginal Discs Incubated on Substrates

Si n-Type



SiO_2 962 nm

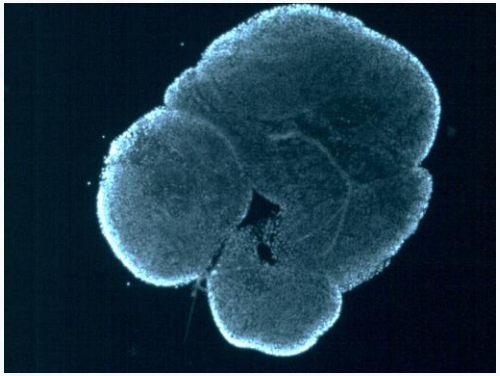


[PLL] = 0,1 mg/ml

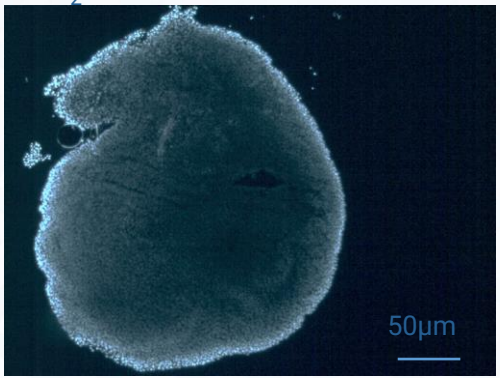
Drosophila Imaginal Discs Incubated on Substrates

PLL-coated substrates (30 min incubation)		
	Attached Disc N° (Tot=4)	Disc %
Si n-type		
0,1 mg/ml	2	50%
0,01 mg/ml	2	50%
SiO_2 962 nm		
0,1 mg/ml	3	75%
0,01 mg/ml	4	100%
SiO_2 303,4 nm		
0,1 mg/ml	4	100%
0,01 mg/ml	4	100%
Processed Si		
0,1 mg/ml	3	75%
0,01 mg/ml	4	100%

Si n-Type



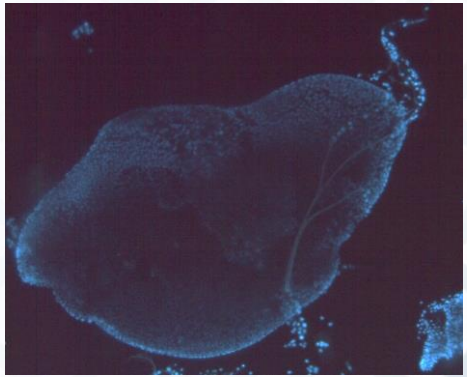
SiO_2 962 nm



[PLL] = 0,1 mg/ml

Not coated substrates (30 min incubation)		
	Attached Disc N° (Tot=9)	Disc %
Si n-type	2	22,2%
Si p-type	5	55,6%
SiO_2 962 nm	2	22,2%
SiO_2 303,4 nm	5	55,6%
Processed Si	3	33,3%

Si p-Type



No coating

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managing technologies

ReadyCell

www.stretchbio.eu

WP 5 – Integration of light sources and detectors

6-month-meeting 01.04.2022

Jens Goldschmidt
Chair for Gas Sensors
Department of Microsystem Technologies – IMTEK
Albert-Ludwigs-University Freiburg, Germany

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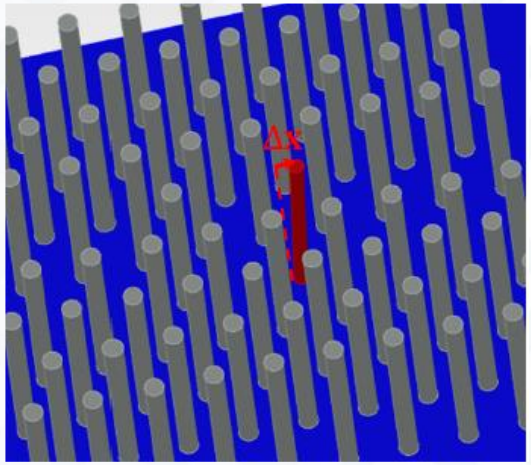
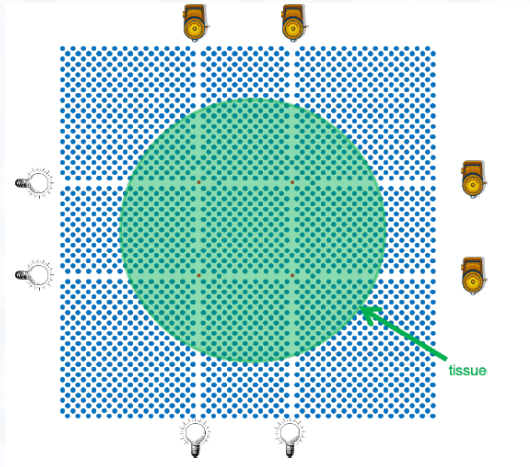
WP 5 – Objectives

- Design and fabrication of light coupling devices to nanopillar array
- Study on
  - Coupling schemes
  - Miniaturized detector systems
  - Coupling of the detector to nanosystem
- Hybrid integration of the optical system
- Design of the experimental setup for complete optical source and detector coupling to the nanosystem





WP 5 – Current Work

- Coupling of NIR sources to nanopillar array with optical gratings
- Simulations to optimize coupling efficiency

  → Study on coupling angles, different grating geometries
- Investigation of alternative coupling techniques

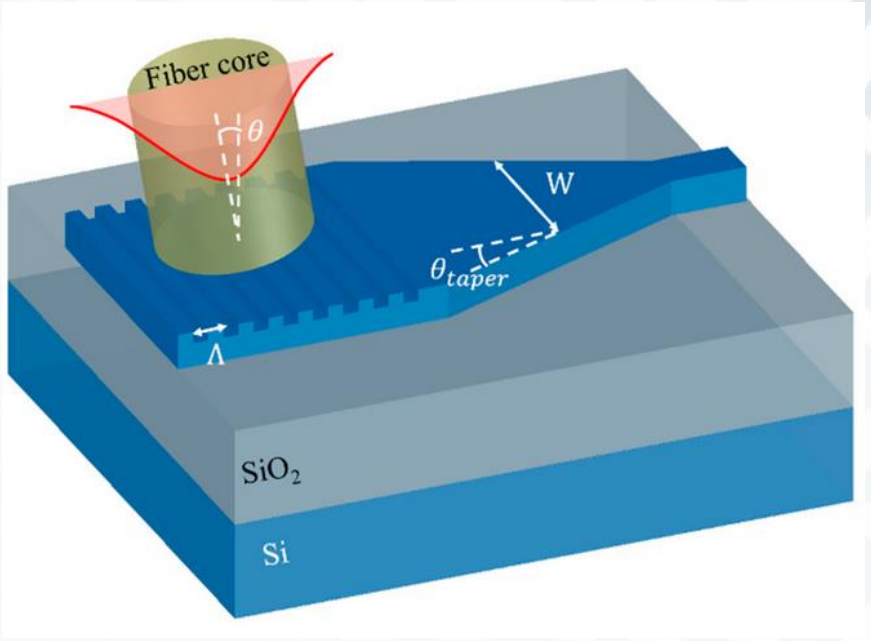
WP 5

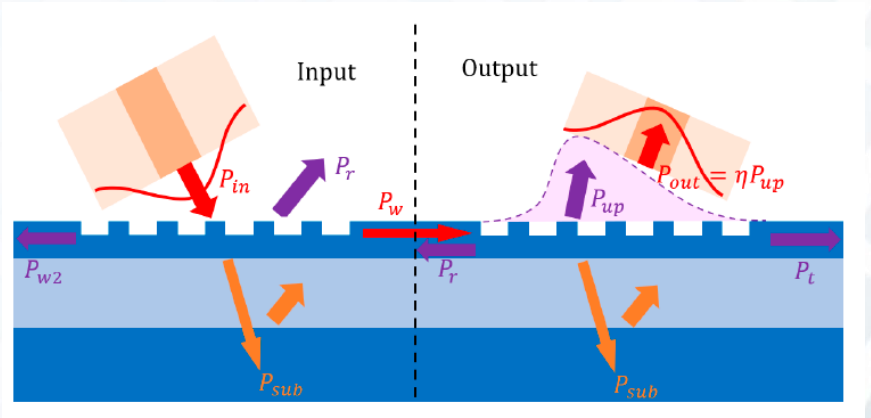
Optical grating couplers

- Bragg-condition

$$\boldsymbol{\beta_m = k_0\, sin\,\Theta + mG}$$

$$\text{with } k_0 = \frac{2\pi}{\lambda_0}, \mathrm{G} = \frac{2\pi}{\Lambda}$$



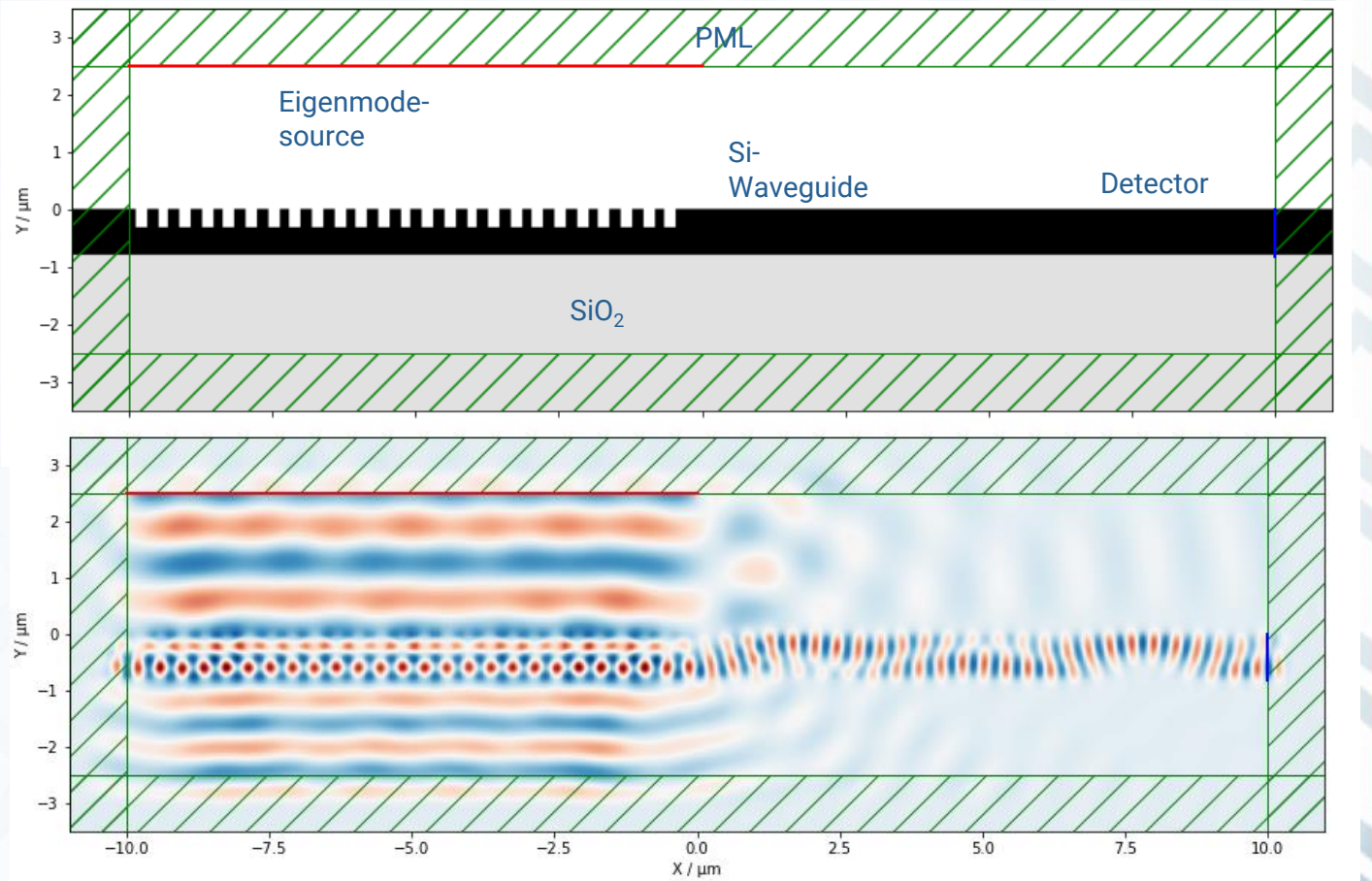


L. Cheng et al. Grating Couplers on Silicon Photonics: Design Principles, Emerging Trends and Practical Issues. *Micromachines* **2020**, *11*, 666.

WP 5

Studies on…

- Grating Designs
  - Coupling efficiencies
  - Wavelength dependence
- Coupling to photonic crystal
  - Mode profile in access-waveguide
  - Mode profile in photonic crystal

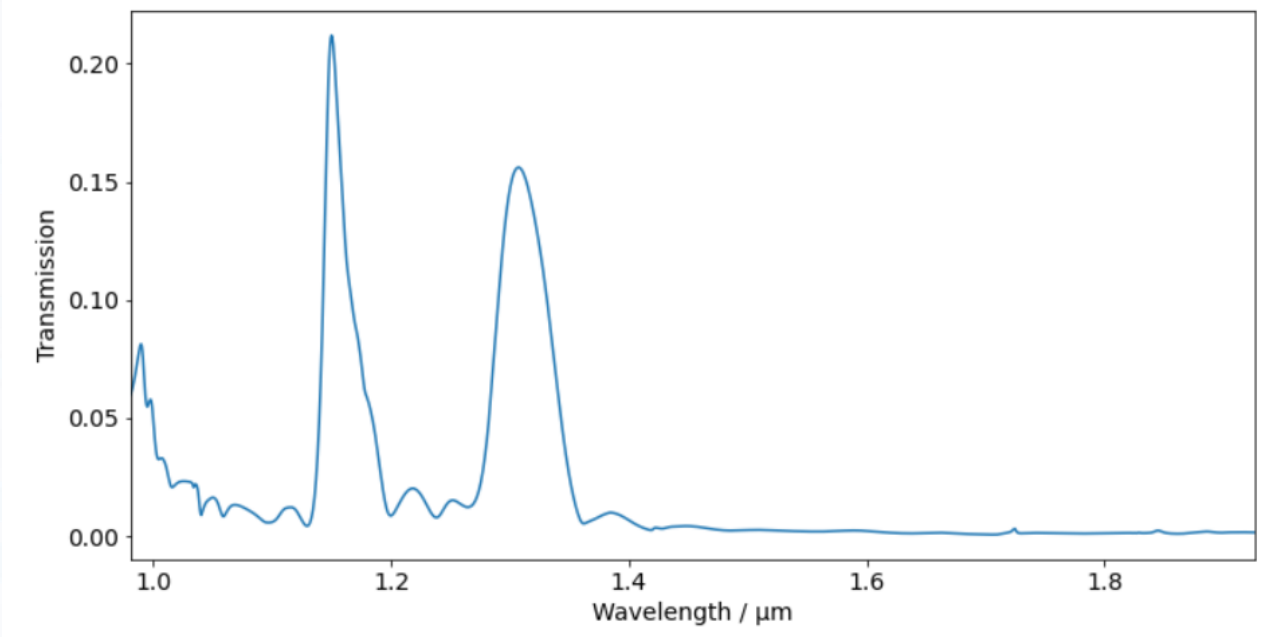


WP 5

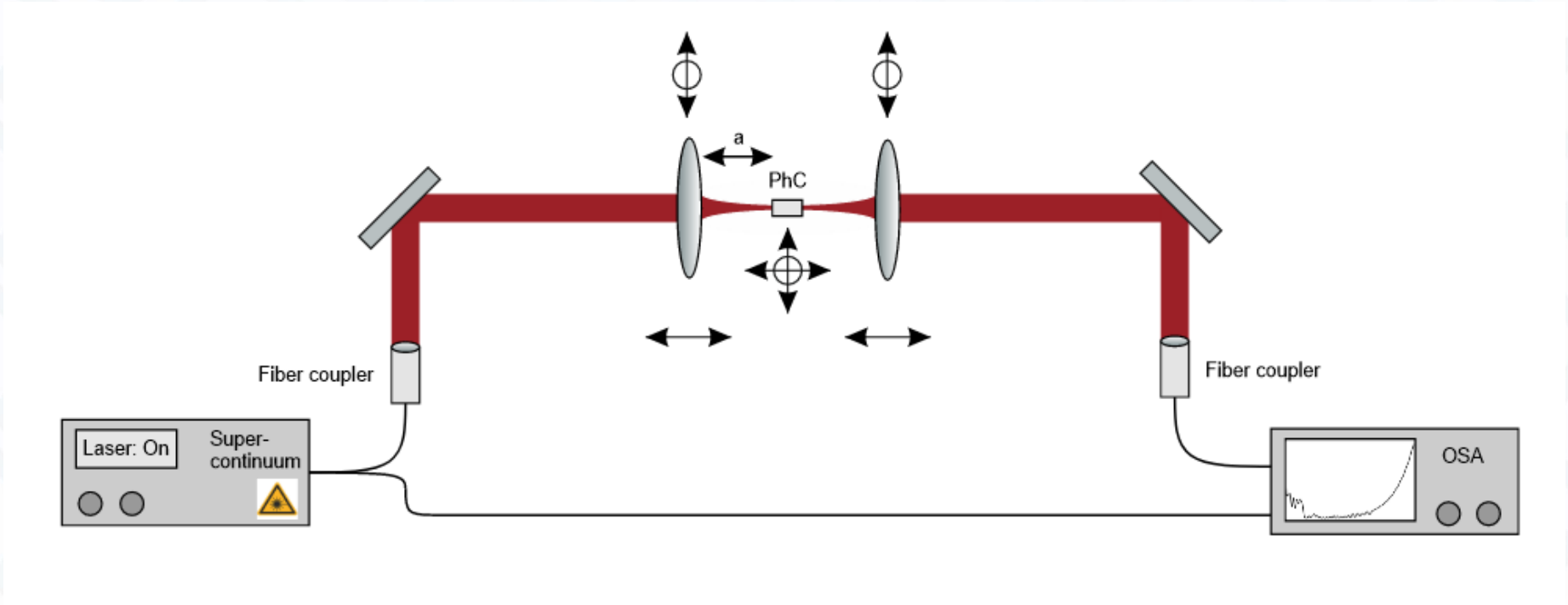
Coupling efficiency

- Finite Difference Time Domain (FDTD) simulation
- Design of grating coupler is wavelength critical

→ Measurement of PBG



WP 5


a
PhC
Fiber coupler
Fiber coupler
Laser: On
Super-
continuum
OSA

WP 5 – Next Steps

- Measurement of PBG
- Design and fabrication of a grating coupler based on measurement results
- Optical setup to investigate coupling efficiences
- Wettability measurements of nanopillar arrays
- Study on commercial and self-designed and fabricated photodetectors for adaption to the nanopillar array

WP 5 – Deliverables and milestones

No.	Deliverable/milestone name	Type	Diss. level	Deliverable month
D5.1	Report on the design and fabrication issues of the optical grating	Report	Public	12
D5.2	Report on photodetector selection and characterization	Report	Public	18
MS7	Optical system coupled to the nanosensor			28

- **D5.1** Gratings have been selected for coupling the nanopillar chip to the light source and detector. The best configurations, compatible with the nanofabrication route, will be simulated, fabricated.
  → September 2022
- **D5.2** Miniaturized photodetectors need to be used to fit the to nanopillar array. Both commercially available as ad-hoc designed detectors will be either adapted or designed.
  → March 2023
- **MS7** An excitation and detection system should be ready, prepared to be combined with the nanopillar array. Verified through the existence of demonstrator D5.3.
  → January 2024

WP8
Exploitation, dissemination, training and communication

ReadyCell & UB

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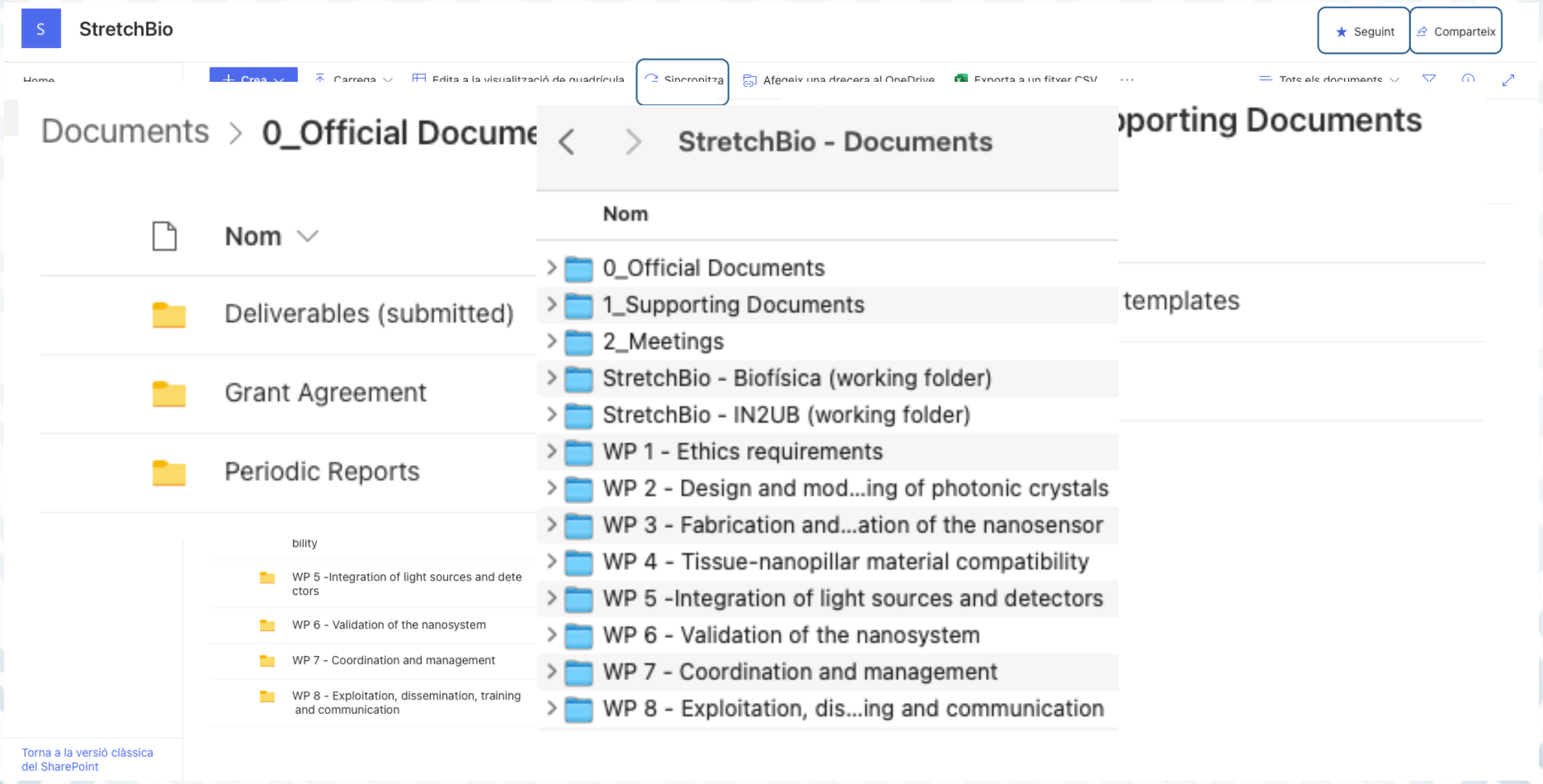
SharePoint

- Web-based collaborative platform – “Intranet”
- Allows simultaneous editing of files
- Core files available at all times

- Each institution has a group that has access to the shared folders
- Global management of this SharePoint so that permissions apply to folders, not files

SharePoint


StretchBio
Seguint
Comparteix
Sincronitza
Documents
0_Official Docume
Nom
Deliverables (submitted)
Grant Agreement
Periodic Reports
bility
WP 5 -Integration of light sources and detectors
WP 6 - Validation of the nanosystem
WP 7 - Coordination and management
WP 8 - Exploitation, dissemination, training and communication
Torna a la versió clàssica del SharePoint
StretchBio - Documents
Nom
0_Official Documents
1_Supporting Documents
2_Meetings
StretchBio - Biofísica (working folder)
StretchBio - IN2UB (working folder)
WP 1 - Ethics requirements
WP 2 - Design and mod...ing of photonic crystals
WP 3 - Fabrication and...ation of the nanosensor
WP 4 - Tissue-nanopillar material compatibility
WP 5 -Integration of light sources and detectors
WP 6 - Validation of the nanosystem
WP 7 - Coordination and management
WP 8 - Exploitation, dis...ing and communication
porting Documents
templates

Logo and fonts

STRETCHbio

Logo & Brand Identity

Brand ide
Style guic

Logo & Brand Identity

Do Not: Logomark

Do not resize or change the position of the logomark.

Do Not: Fonts

Do not use any other font, no matter how close it might look to Nexa

Do Not: SIzing

Do not use squish or squash the logo. Any resizing must be in proportion.

Do Not: Colour

Do not change the colours even if they look similar. Use the official colour specifications detailed in these guidelines

Website: Open positions, outreach activities and more

- Open positions
- Outreach activities
  - Conferences
  - Seminars
  - …
- Resources
- Anything you do that can be shared
  - Meetings
  - Lab pictures
  - …

Next steps

- Social Media - Twitter… LinkedIn? Instagram?
- Outreach activities
  - European Researcher’s Night
  - Week of science
  - Open days
  - Presentations: museums, hospitals…
- Leaflet
- Roll-up

Next steps

- 3D animated video of sensor operation
- Pictures and videos
- Infographics of preliminary results
- Newsletter
- Media

KPI's

Tool/Method	Metrics	KPI(s)
Website	Visitors and views Most viewed website pages (sections) Search terms and search engines Downloads of the deliverables Downloads of communication materials	
Social Networks	Posts Followers/Members Visits and visualizations	
Newsletter	Subscriptions Opening rate	

KPI's

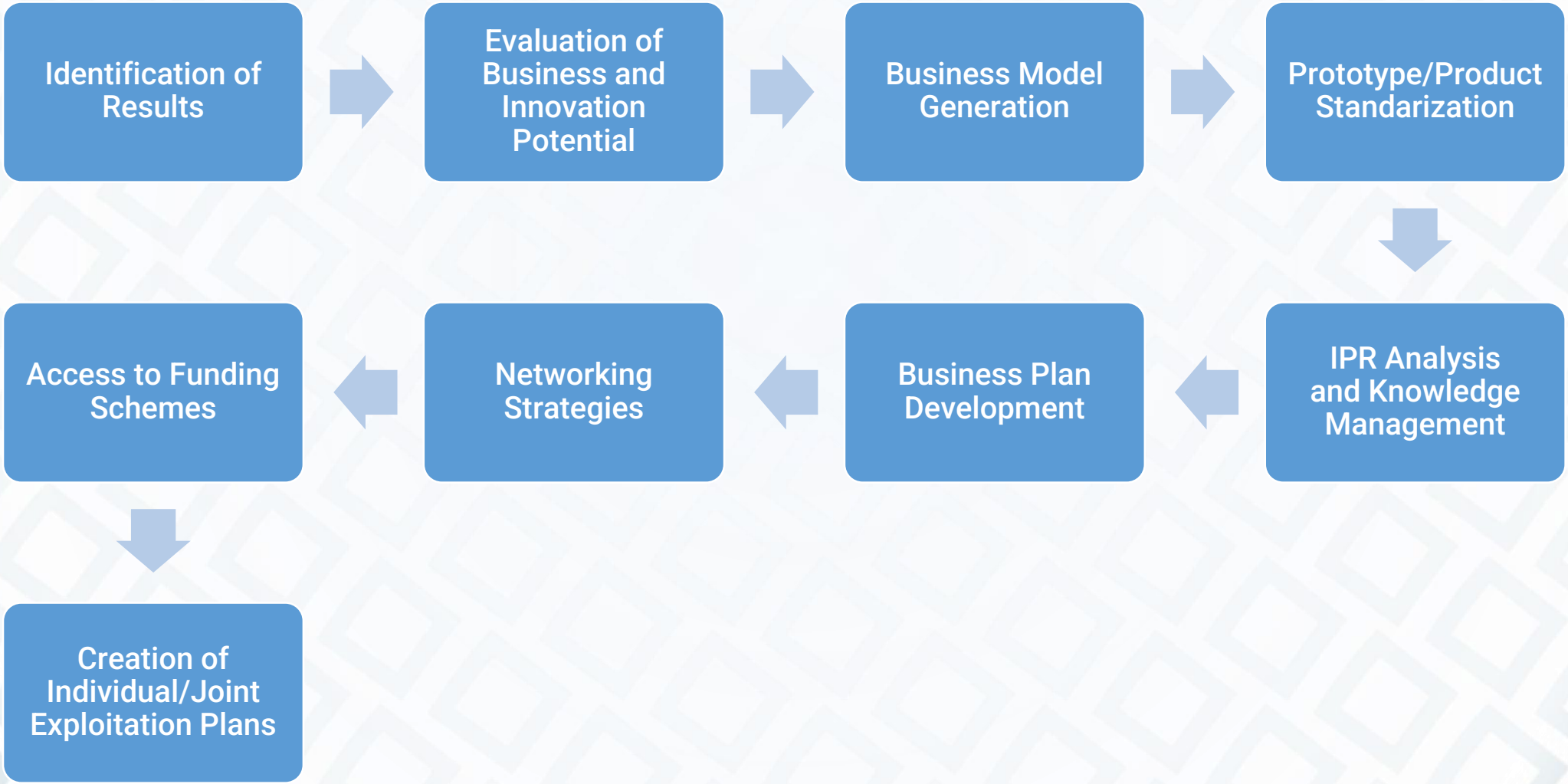
Tool/Method	Metrics	KPI(s)
Announcements on partners' websites, press releases campaign, publication of articles	Press releases Visualizations Newsfeeds published on the partner's website Appearance of StretchBio in stakeholders' websites	
Participation in the media (TV, radio)	Appearances Speeches/Interviews released	
Participation in relevant events	Conferences and workshops attended Project presentations done New synergies established	
Outreach	Participants New connections established	

Exploitation

- The strategy and process that allow the capitalization of the tangible and intangible results of the StretchBio project.

What are your expectations?

Exploitation *(example of methodology)*



Exploitation *(examples of success story)*

- The PVSITES project successfully demonstrated several Building-integrated Photovoltaics (BIPV) installations across the EU, which then moved to address the efficient manufacturing of BIPV modules, using the advisory services of the Horizon Results Booster.
- Onyx, leader of the project, was also the beneficiary of an SME instrument stage-two project, to develop the BIPV glass-glass modules.
- The company Onyx solar is currently commercializing one of the world's largest BIPV glass façade modules.

- The H2020 funded STEELANOL project sought to capture and reuse a portion of carbon emitted by the steel industry without the need to rebuild the BAT (Best Available Technologies) steel plant while supplying the transport sector with high-grade biofuel.
- The consortium, led by LanzaTech, is now scaling up this technology and building an actual plant thanks to funds from the InnovFin Energy Demonstration Projects (EDP).

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