

Custom Built Biology for Patients

Leerink 10th Global Healthcare Conference 25 February 2021

Molecular Partners AG, Switzerland (SIX: MOLN)

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Pioneering DARPin[®] Solutions

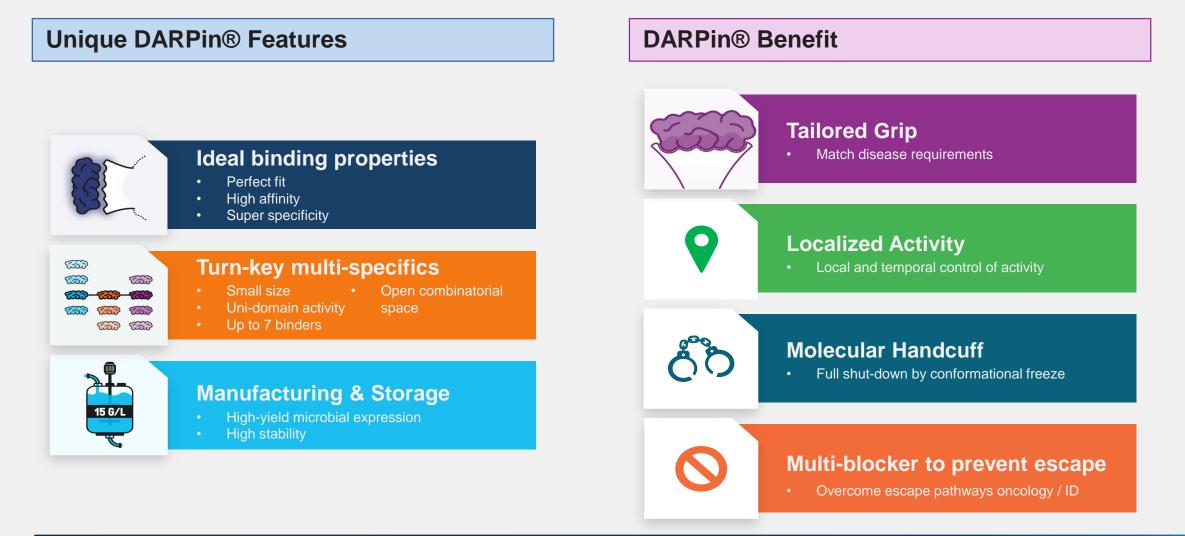
We translate the unique properties of the **DARPin[®] drug class** into patient value We build a **broad pipeline** of DARPin[®] therapeutics to address unmet medical need We aim to transform the lives of people with serious diseases by delivering truly innovative solutions

our purpose

A global team united around a common purpose of making a positive impact in patients' lives

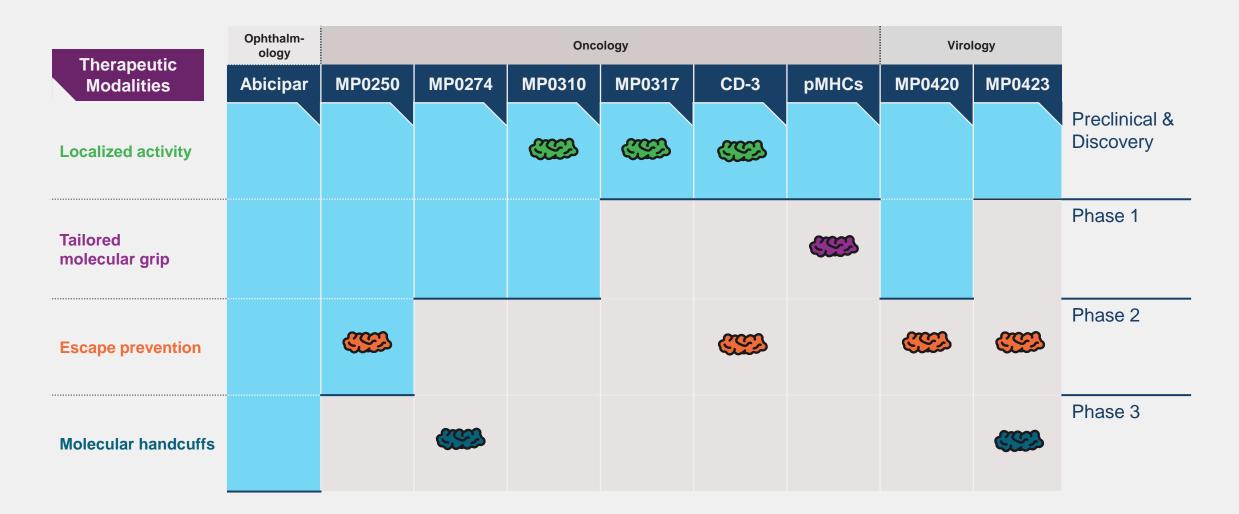


Innate Advantages Combined With Proprietary Approaches





A Portfolio Strategy Delivering Growth And Innovation





Synergistic Partnerships Built on a Versatile Drug Class

Ophthalmology

Therapeutic Area Deal

- Partnership for abicipar, two positive Phase 3 studies.
- Received \$150m to date;
 \$360m in potential milestones and teens royalty still possible
- CRL (June 2020): AbbVie evaluating next steps with agency

abbvie

Oncology

Product Combination Deal

- Partnership with Amgen to combine AMG 506 / MP0310 with BiTE[®] molecules
- Phase 1 conducted by MP and Amgen to develop for combination studies
- ~\$500m in milestones and mid teen royalties

AMGEN[®]

Virology

Capability Deal

- Leverage production, global development and distribution of Sandoz Novartis for MP0420
- ~\$165m milestone payment upon commercialization licensure
- 22% royalty on sales

U NOVARTIS

Over ~\$1B in potential milestone across multiple programs





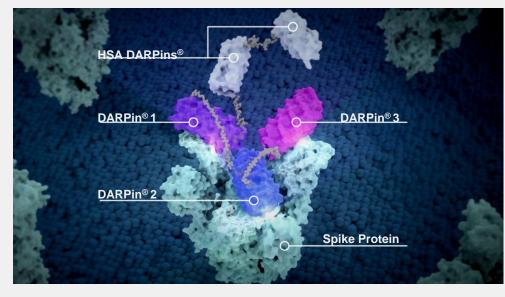
Clinical Program: Anti-COVID19

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Our COVID-19 Program: Two Outstanding Candidates

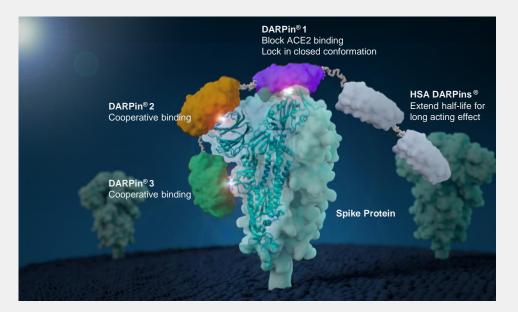
MP0420 (ensovibep)- best-in-class

- Tri-specific DARPin[®] antiviral targeting the RBD for highest potency & to prevent viral escape
- Long half-life (HSA DARPins) single injection
- Low costs and high numbers of doses available
- Potential for bolus / s.c. injection simple application



MP0423 – first-in-class

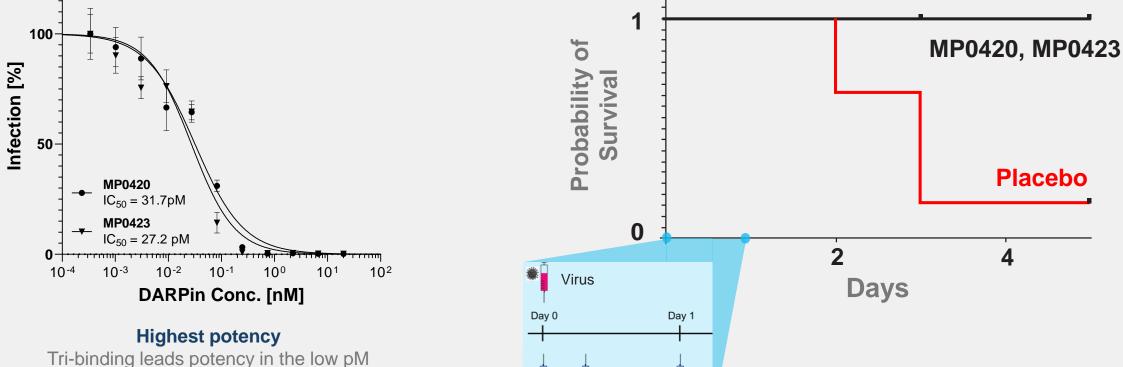
- 3 DARPins blocking different domains of the viral spike
- High activity even if RBD mutates heavily and escapes all vaccines and therapeutic antibodies
- All other benefits of MP0420





High Potency Inhibition Translates To *In Vivo* Prophylactic And Therapeutic Properties

In vitro activity: Pseudotype Neutralization Assay In vivo activity: Kaplan Meier Plot -Hamster Model (6 animals/group)



or

0 h

DARPin

6 h

DARPir

or

24 h

DARPin

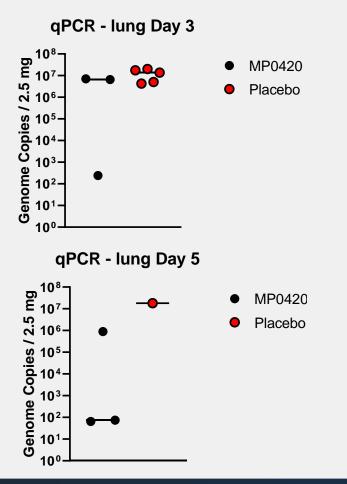
range; likely at the assay limit

MOLECULAR

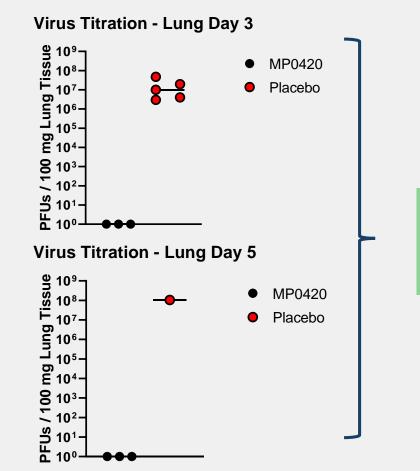
partners

Ensovibep Blocks the Virus and Prevents Infection in the Lung

Viral titer in the lung



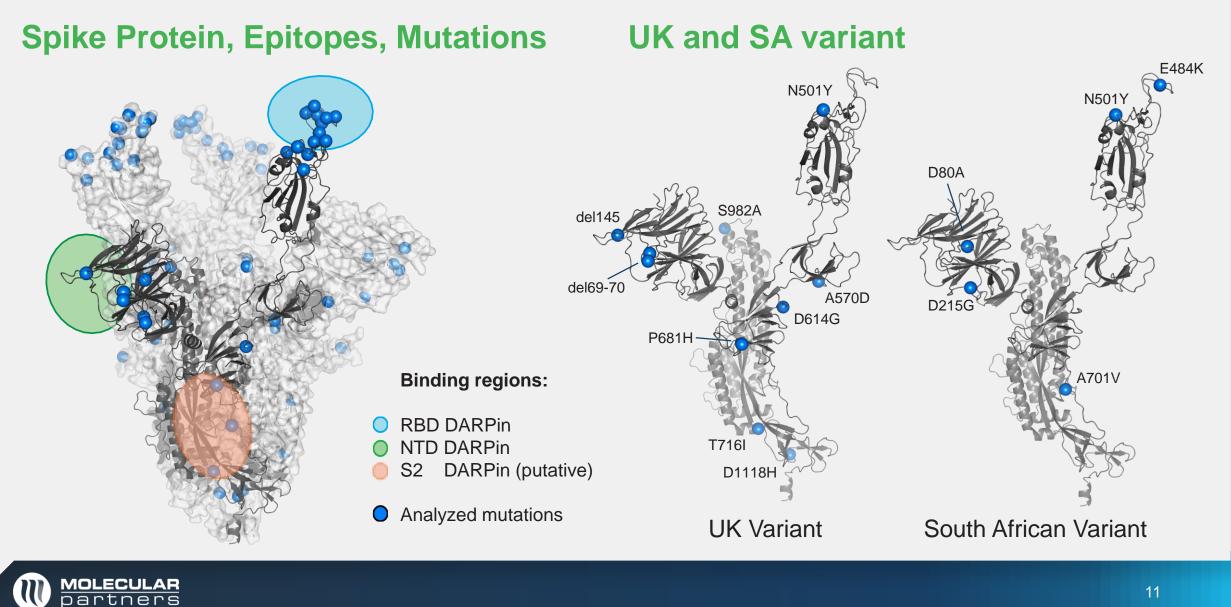
Viral infectivity in the lung



Ensovibep blocks viral infectivity completely



SARS-Cov2 Spike Protein: domains, mutations, variants



Potency of our Candidates on viral mutants & variants

Variants	Rational	VSV Neutralizaiton Assay IC ₅₀ [ng/mL]			
		MP0420	MP0423	REGN 0933	REGN 10987
wild type	(Wuhan)	1.0	3.1	3.9	6.1
B.1.351	(SA, Δ5)*	3.0	2.4	19.4	6.2
B.1.1.7	(UK, Δ9)**	1.7	70.1	2.4	3.5
Individual M	Autations: Residues in variants				
N501Y	in UK, SA, BRA variants; increases RBD/ACE2 interaction ¹	0.5	1.4	4.3	5.8
E484K	in SA, BRA variants; increases RBD/ACE2 interaction ¹	2.7	1.8	17	5.8
K417E	residue mutated to N/T in SA, BRA variants	0.5	1.2	>100	1.5
Y453F	key residue evolved in Danish mink farms variants	3.2	2	>100	11.8
	Iutations: Highly frequent mutations				
D614G	Wide global spread	2.4	2.8	n.d.	n.d.
S477N	Wide global spread	1.9	0.8	n.d.	n.d.
N439K	Wide spread in northern amerika, UK; increases RBD/ACE2 interaction ¹	1.3	2.5	2.8	30.1
A222V	Wide European spread	2.2	3.1	7	2.9
Individual N	Autations: RBD epitope or reported resist	ance for other	therapeutics		
G446V		1.7	1	1.5	>100
G476S		1.5	3.1	n.d.	n.d.
T478I		2.7	2.8	4	7
P479S		2.1	1.5	3.7	9.8
V483A		2.3	1.9	n.d.	n.d.
F486V	reduces RBD/ACE2 interaction non-fit virus ¹ ; key residue DARPin RBD binder ²	>100	7.7	>100	4.4
Q493K		7.9	2.4	>100	10
F490S	Reduces RBD/ACE2 interaction ¹	3.8	1.6	3.1	9.2

Legend for the table

- n.d.: not determined
- Mutations (SA)*: D80A, D215G, E484K, N501Y, A701V
- Mutations (UK)**: del69-70, del145, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H
- Redish shade: IC50 values between >100 ng/mL (outside therapeutically active range)
- ¹ Influence of residue mutations on spike protein binding to human ACE2 (Yi et al. 2020)
 - Increase: stronger ACE2 binding = fitter virus
 - Decrease: weaker ACE2 binding = unfit virus
- ² Predicted interaction residue for DARPin RBD binder (Walser et al. 2020)



Cooperative binding – potency of the modules

		VSV Neutralizaiton Assay IC ₅₀ [ng/mL]					
Variants	Rational	MP0420	Mono-valent RBD Binders in MP0420				
			RBD-1	RBD-2	RBD-3		
wild type	(Wuhan)	1	7.2	2.1	13.3		
B.1.351	(SA, Δ5)*	3.0	76	26	>100		
B.1.1.7	(UK, Δ9)**	1.7	4.6	5.4	11.7		
		dual Mutations : Re	sidues in variants				
N501Y	in UK, SA, BRA variants; increases RBD/ACE2 interaction ¹	0.5	9.1	4.8	27.8		
E484K	in SA, BRA variants; increases RBD/ACE2 interaction ¹	2.7	64.2	10.2	>100		
K417E	residue mutated to N/T in SA, BRA variants	0.5	1.8	1	3.6		
Y453F	key residue evolved in Danish mink farms variants	3.2	10.9	5.9	3.3		
	Individual Mutations: Highly frequent mutations						
D614G	Wide global spread	2.4	11.9	6.2	23		
S477N	Wide global spread	1.9	3	2	9		
N439K	Wide spread in northern amerika, UK; increases RBD/ACE2 interaction ¹	1.3	7.3	5.3	12.9		
A222V	Wide European spread	2.2	3.3	4.6	19.5		
	Individual Mutations: Within RBD epitope of DARPins or reported resistance mutation for other therapeutic						
G446V		1.7	0.7	1.8	2.3		
G476S		1.5	2.3	3.7	29		
T478I		2.7	11.2	3.1	16.7		
P479S		2.1	7.2	2.3	27.6		
V483A		2.3	21.8	8.4	21.3		
F486V	reduces RBD/ACE2 interaction non-fit virus ¹ ; key residue DARPin RBD binder ²	>100	>100	>100	>100		
Q493K		7.9	30	28.2	45.8		
F490S	Reduces RBD/ACE2 interaction ¹	3.8	2.3	1.7	8.1		



MP0420 (ensovibep) Phase 1 Ongoing

- Study initiated November 2020, first cohort fully enrolled
- Double-blind, placebo controlled trial exploring safety and PK.
 - IV administration
 - Up to 24 subjects total, stratified 3:1 (active: placebo)
 - Ages 18-65
- Dose range include 3 mg/kg (225 mg*), 9 mg/kg (675 mg) and 20 mg/kg (1.5 g)
- Endpoints: Safety, tolerability and pharmacokinetics (SAD)
- Status:1st cohort completed; 2nd cohort ongoing

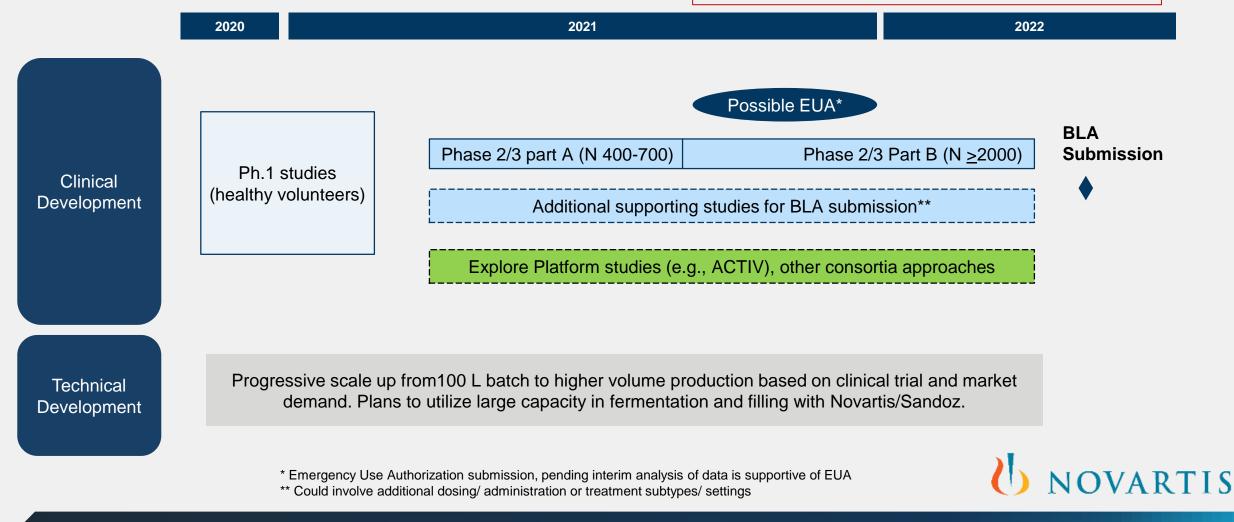
Full data expected by Q1 2021

* Total amount in a person with 75 kg body weight



Novartis: Draft Development plan for MP0420

ALL DATES PRELIMINARY, SUBJECT TO HEALTH AUTHORITY INPUT

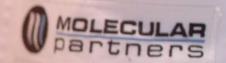


Novartis Collaboration Highlights Strengths of Each Company









Clinical Programs: Tumor Localized Activators

Local Activation of Immune cells: Fibroblast Activation Protein (FAP) as a General Switch

High FAP concentration near

FAP

tumor clusters receptors

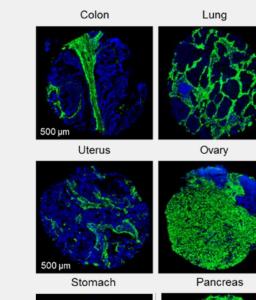
Immune cell is activated

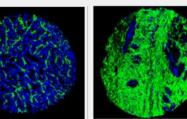
BODY

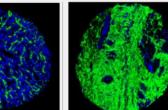
- In normal tissues, receptor is broadly distributed
- Immune cell remains inactive

TUMOR

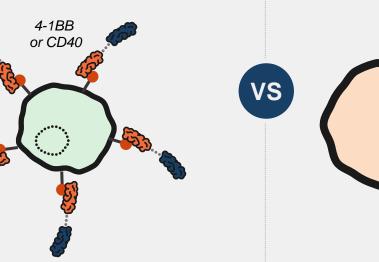
Tumor stroma





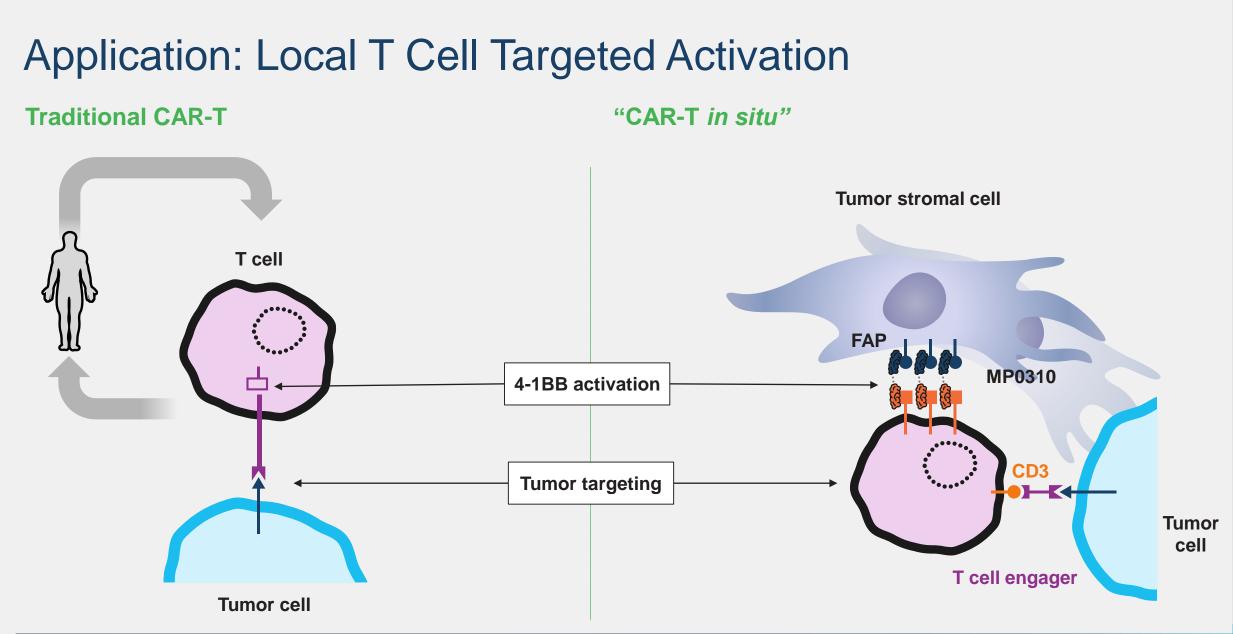


Human FAP, DAPI



- No activation by mono-binding of FAP or CD40/4-1BB •
- Simultaneous binding leads to tumor-local immune activation •



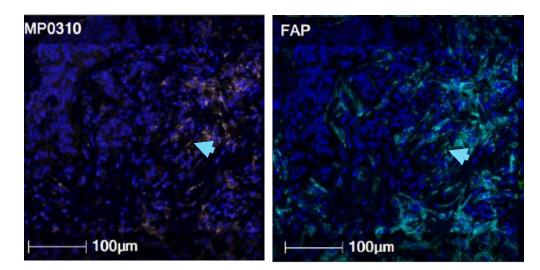




AMG 506 / MP0310 Accumulates in Tumor Tissue in Dose Dependent Manner

MP0310 (0.5mg/kg) colocalizes with FAP

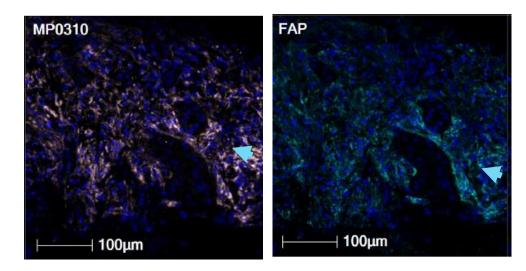
MP0310 < FAP



Endometrial carcinoma (Liver metastasis), C1D15

MP0310 (5mg/kg) saturates FAP

MP0310 > FAP



NSCLC (lung), C1D15



AMG 506 / MP0310 Dose Escalation Completed

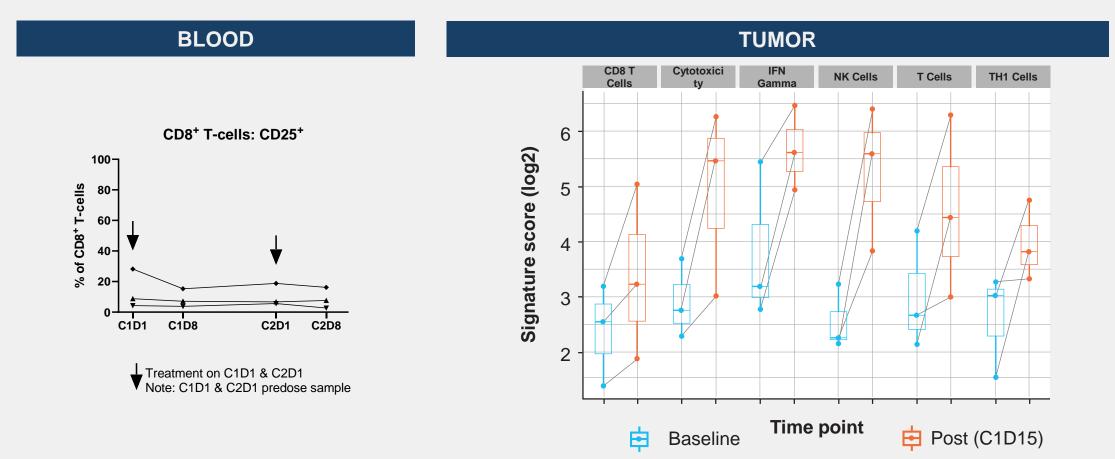
- Executed on schedule through 2020
- 22 patients enrolled, 19 presently evaluable
- 7 dosing cohorts
 - Dosing: 0.015 mg/kg to 12 mg/kg
 - 8 patients with ≥4 cycles
- No Dose limiting toxicities (DLTs)
- 12 patients exhibited infusion related reactions (IRR) G2-3, out of 22 enrolled.
- No other AEs of special interest

AESI	N affected pts. / N events	Max. grade
Infusion related reactions > G 1*	12/19	3
Cytokine release syndrome – any	0	-
Hepatitis – any	0	-
Pneumonitis – any	0	-
Respiratory distress – any	0	-
Colitis – any	0	-
Endocrinopathies > G 2	0	-
Skin Rash > G 2	0	-
Tumor lysis syndrome – any	0	-
Nephritis > G 1	0	-
Auto-immune disease > G 1	0	-

* Not included here: 1 IRR event G1;



PD Activity in Paired Biopsies Supports AMG 506 / MP0310 MoA on 4-1BB Activation



 In the blood, immune cells remain inactive (CD8⁺ & CD4⁺ T-cells, Treg, NKT, B-cells, NK)

MOLECULAR partners In the tumor, T-cells and NK cells are activated

AMG 506 / MP0310 Dose Escalation Completed

- 22 patients enrolled
- 19 presently evaluable
- Typical Phase I population
 - heavily pretreated
 - with different cancer indications
- 8 patients with ≥4 cycles
- 9 patients with PD
- 9 patients with SD
- Cohort 7 not evaluable yet

Cohort	Patient ID	Cancer type	Cycles	Best Response
1	03-001	Mesothelioma	4	SD
0.015mg/kg	03-002	Cutaneous squamous cell	5	SD
	03-003	Mesothelioma	4	SD
2	02-001	Ovarian adenocc	4	PD
0.05mg/kg	01-001	Pancreatic adenocc	3	SD
	03-004	Pancreatic adenocc	2	PD
3	03-005	Endometrial adenocc	2	PD
0.15mg/kg	01-002	Pancreatic adenocc	2	PD
	02-003	Pancreatic adenocc	2	PD
4	03-006	Mesothelioma	5	SD
0.5mg/kg	02-004	Pancreatic adenocc	3	uPD
	01-003	Endometrial adenocc	2	PD
	02-005	Melanoma	5	SD
5	01-004	Adenocc colon	2	PD
1.5mg/kg	03-007	Mesothelioma	6	SD
	03-008	Mesothelioma	4	SD
6	03-009	NSCLC	2	SD
5mg/kg	01-006	Melanoma	2	PD
	02-006	H&N scq.cell cc	2	PD
7	01-007	Adenocc colon	2	Pending
12mg/kg	03-010	Mesothelioma	2	Pending
	02-007	Cervical	1	Pending



AMG 506 / MP0310 – Key Messages

1. Good safety profile without major systemic toxicity

- a. No liver toxicity, no systemic activation of immune cells
- b. IRRs frequent but manageable
- 2. MP0310 is observed in tumor tissue
- 3. Tumor biopsies show tumor-localized immune response consistent with the MoA
- 4. Next step: investigate appropriate dosing schedule for sustained activity



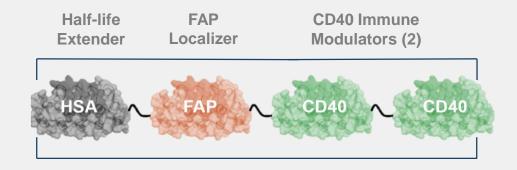
MP0317: Localized Activation of CD40

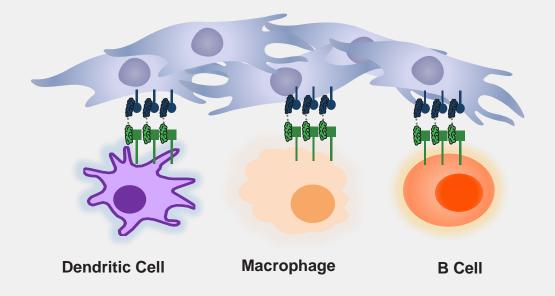
Current limitations and opportunity

- Rather low MTDs for systemic antibody agonists (< 1mg/kg)
- Likely need for combination therapy leading to additional risks for toxicity

Opportunity

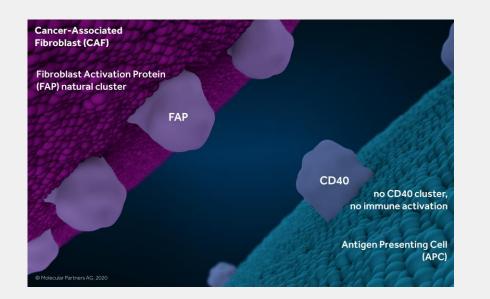
- Localized activation approach to limit systemic side effects and open a therapeutic window for combinations
- FIH H2 2021

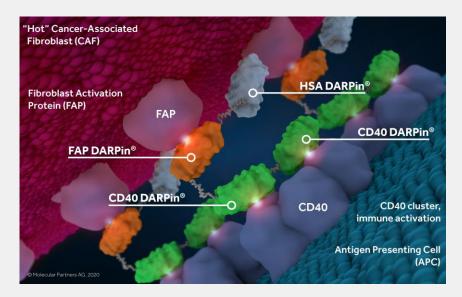






CD40 requires clustering for activation

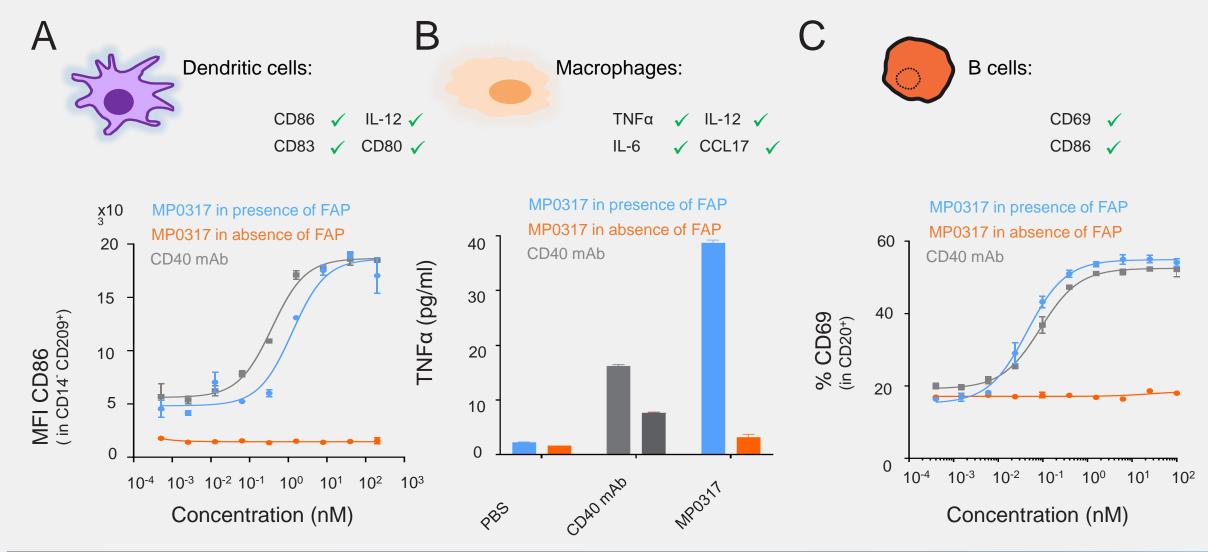




- Efficient signaling through CD40 requires high level of cross-linking
- Our solution: a FAP x CD40 bispecific molecule binding a densely expressed tumor associated antigen for clustering



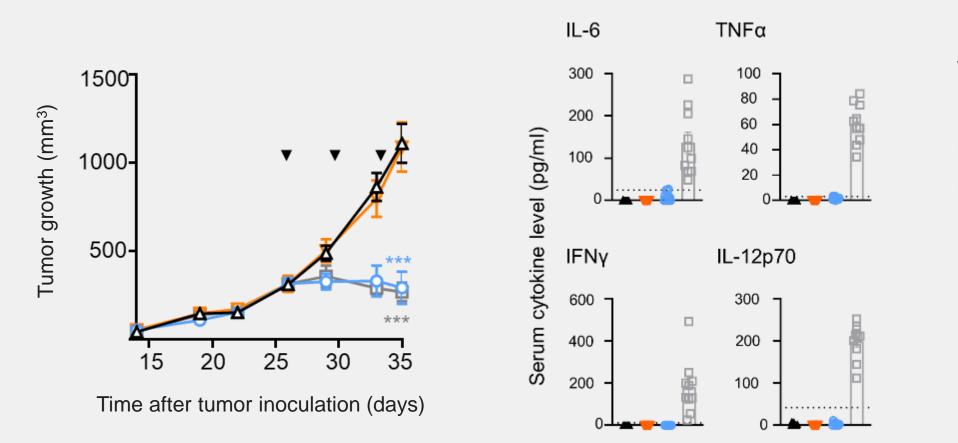
MP0317: FAP-dependent Activation of Specific Immune Cells





MP0317 Shows Full Activity with No Detectable Side-effects

FAPHIGH TUMOR: MC38-FAP Colorectal cancer



Vehicle Neg. CTRL* mFAP x mCD40 mCD40 Ab



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New Therapeutic Platforms: Unlocked

From DARPin[®] Features to Benefits

DARPin® Facts



- Small (15 kDa) and simple
- High affinity and specificity
- High stability and solubility
- · Well expressed in bacteria
- "Nature's choice" for multispecificity
- Tunable systemic half-life
- Safe & efficacious in clinic

Unique DARPin® Features

• **Turn-key Multispecifics:** multi-DARPin® formatting with up to 7 functionalities in one molecule



• Super Specificity: Based on structure of binding surface



DARPin® Benefit

- **Disease-localized activity** to open the therapeutic window
- Multi-blocker to prevent escape and resistance



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- Molecular handcuff for complete inhibition
- **Tailored "grip"** on hard to bind targets (e.g. pMHC)



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• Broad potential waiting to be unlocked



Unlock and Expand: Therapeutic Platforms

Targeting peptide MHC complexes

Next-generation T-cell engagers

Tumor-localized immune cell activation

 $\mathbf{K} \stackrel{\mathbf{A}}{\mathbf{\nu}}$ **Expand** application space



Unlock therapeutic platforms

Challenges of T-cell Engagers in the Clinic

TOXICITY PROFILE LIMITS OPTIMAL DOSING



LACKING LONG-LASTING AND DEEP RESPONSES

Attack on healthy tissues

(on-target off-tumor binding)

Hyper-immune stimulation: CRS and neurotoxicity



Tumor escape & relapse (heterogeneity, target loss, mutation or downregulation)

Lack of efficacy in solid tumors

(tissue penetration, suppressive microenvironment, T-cell exhaustion...)



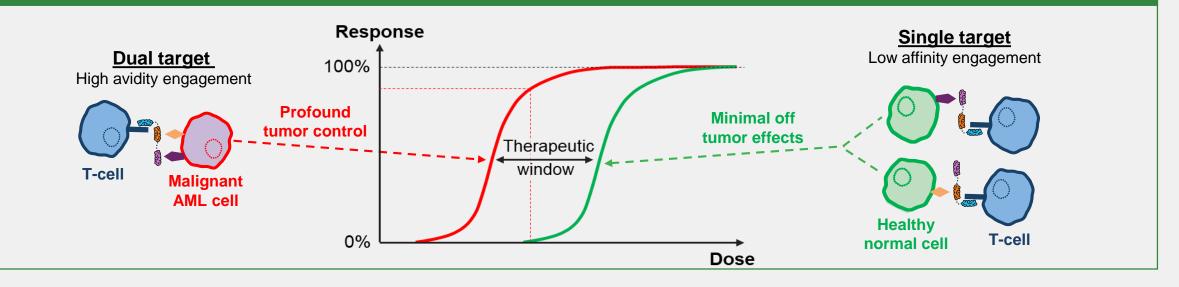
Multi-specific DARPin® T-cell Engager with Improved Benefit/Risk in AML

Medical problem

- High medical need and high relapse rate in AML with current therapies
- Single-target T-cell engagers show promising efficacy, but optimal biological dose level not reached due to **dose-limiting toxicities**

DARPin[®] solution

• Multi-DARPin with enhanced tumor selectivity to (i) reduce off tumor effects, (ii) achieve higher dose levels and ultimately, (iii) better efficacy

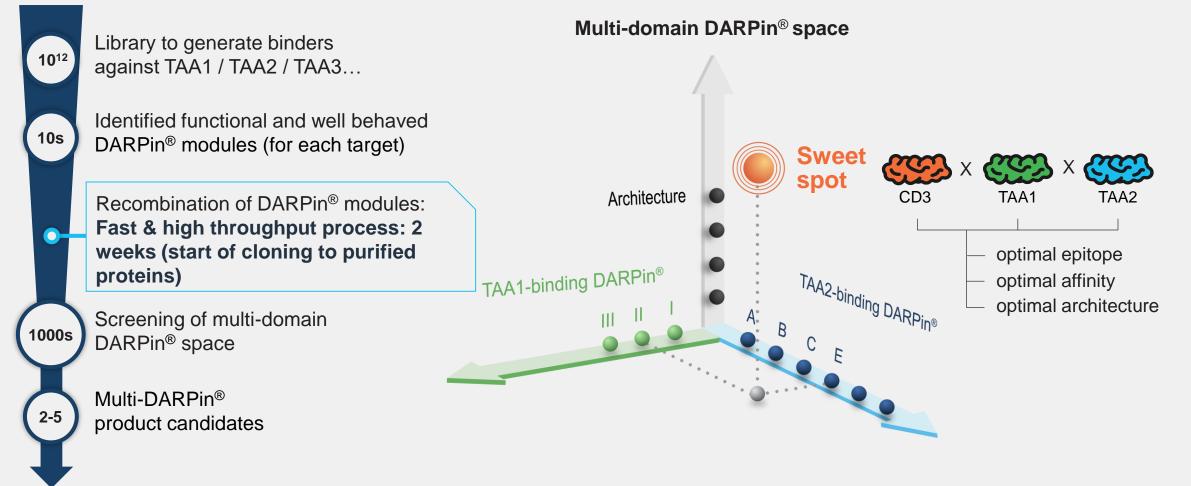




Multi-DARPin® Versatility Allows Screening for Function Sweet Spot

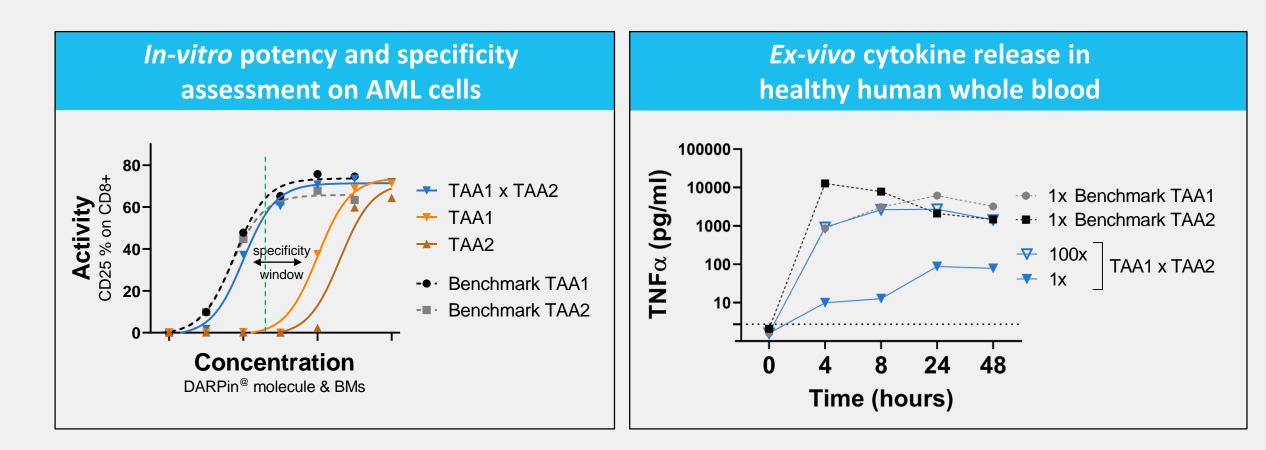
molecules

MOLECULAR



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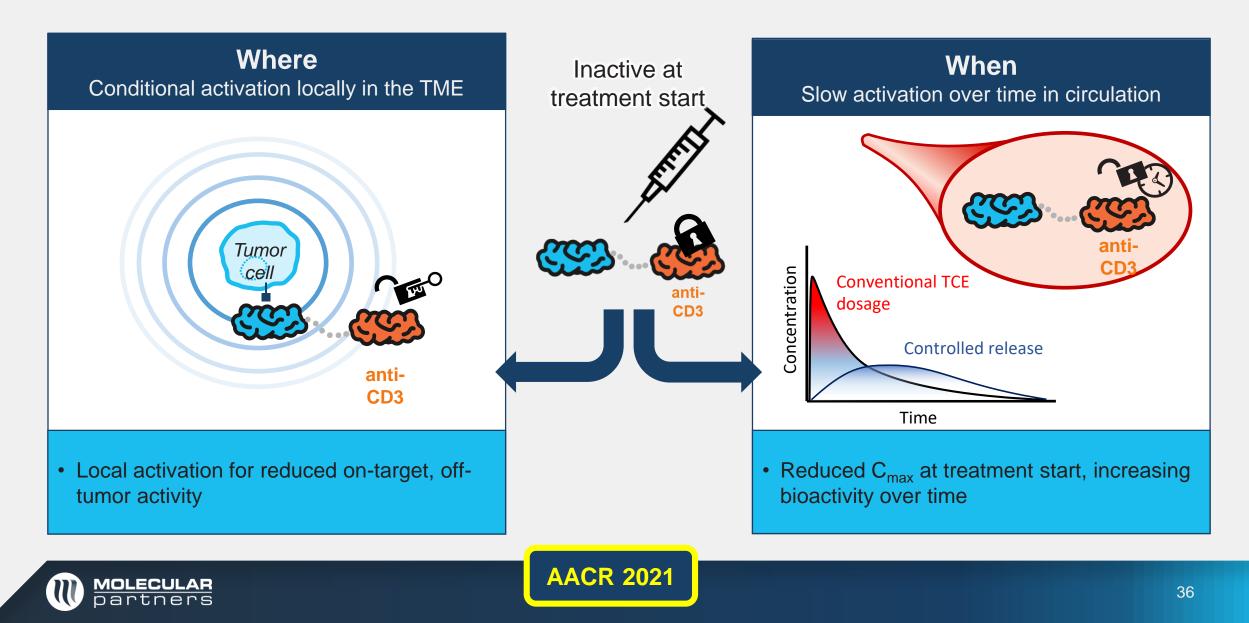
Multi-DARPins® for AML Show High Potency, Improved Selectivity and Potential for Reduced CRS



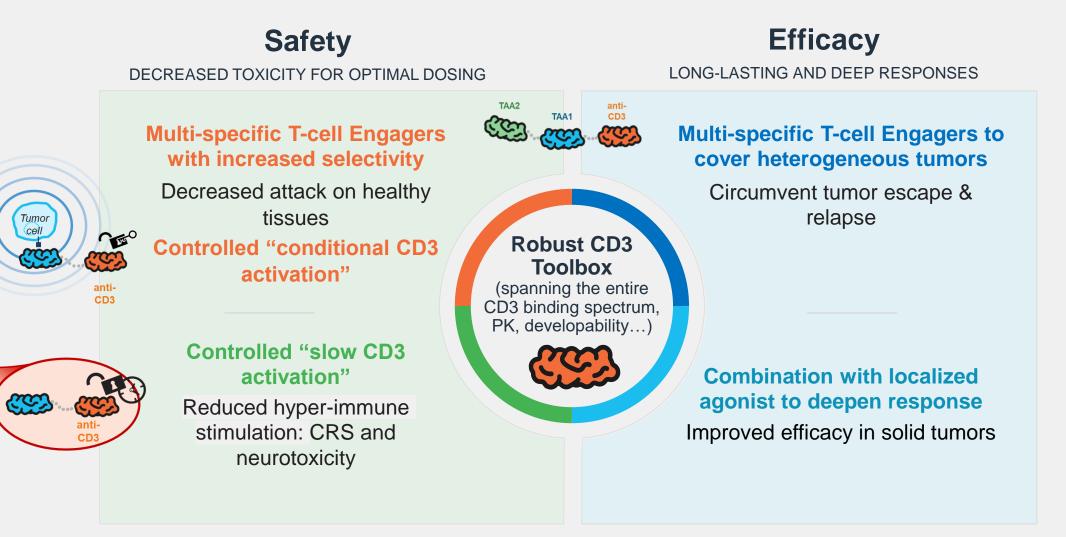


AACR 2021

Expand with Platform for Controlled Activation of CD3 Effector Function

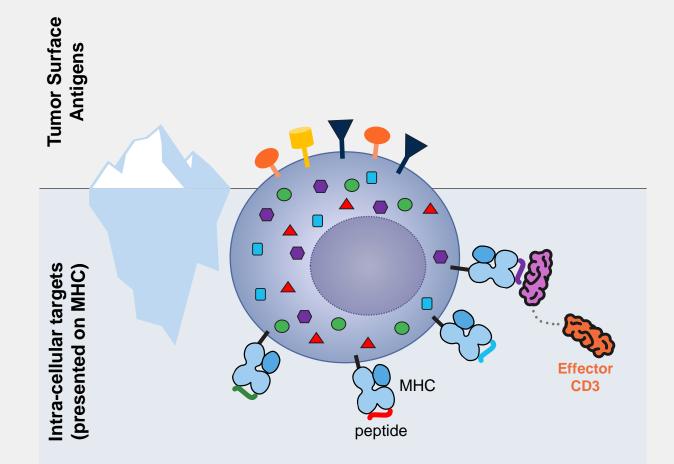


DARPin® solutions for improved benefit-risk profile of T-Cell Engagers





Peptide MHC Complexes: "Inaccessible" Intracellular Targets



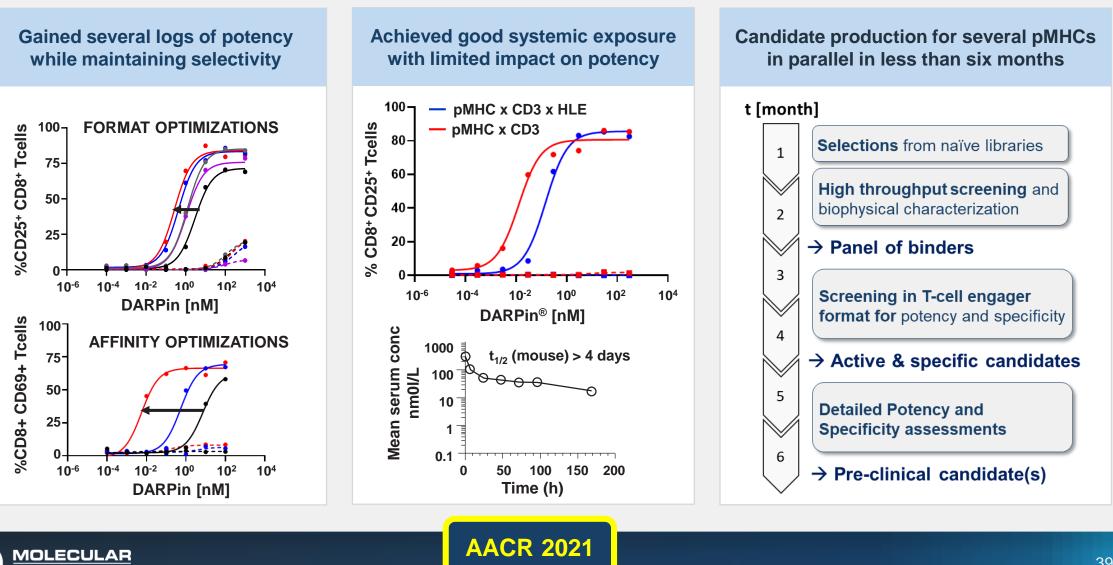
Challenges of the pMHC redirected T-Cell engager field:

- Generation of binders with high selectivity and high potency
- High investment to generate binders
- Systemic half-life extension often leads to loss of potency
- Developability properties not ideal
- Target identification and validation
- Complex clinical development path

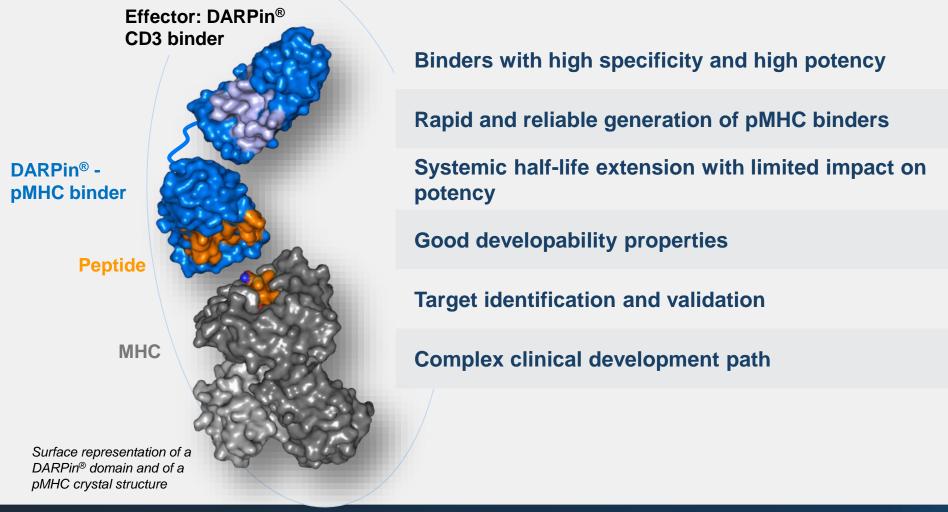


Multiple Technical pMHC Challenges: Solved

artners



DARPin® Platform Especially well Suited to Address pMHC Targets

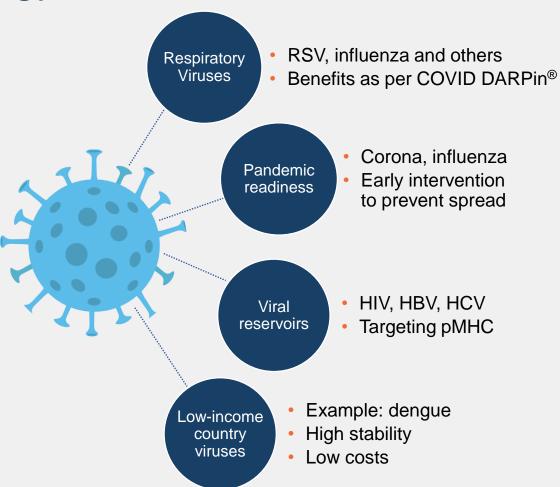




DARPin[®] Opportunities in Virology



- Multi-valency for superior potency
- **Multi-specificity** for mutation resistance
- Speed of candidate generation
- High amount & low-cost production
- High stability and solubility for simple administration and distribution







Summary

Financial Overview & Milestones:

- YE Cash 2020: ~174M CHF, no debt
 - Successful capital raise of CHF 80m, completed in early July 2020
- Additional funding from Novartis transaction (CHF 60m, received per end October 2020)
 - Funded into 2023, without consideration of future milestones
- ~\$1B in potential milestones from R&D partners yet to be realized
 - \$165m milestone from Novartis upon commercial licensure of COVID-DARPins
 - ~\$500m in milestones from Amgen for AMG 506 / MP0310
 - >\$360M in approval and commercial milestones associated with Abicipar
- Up to double-digit royalties outstanding with current R&D partners



Upcoming Catalysts Across The Portfolio in 2021

Antiviral portfolio			
Ensovibep (MP0420) MP0423	 POC with EUA/BLA and approval in 2021 Emergency Use Authorization and/or BLA submission possible in 2021 MP0423 FIH 		
Novel antivirals	 Develop novel DARPins for viral targets with first new target announced 2021 		
Immuno-oncology portfolio			
AMG 506 (MP0310)	 Identify ideal dosing regimen in ongoing Phase 1 (H1/2021) Amgen potential combination trials (H2/2021) 		
MP0317	 MP0317 FIH in H2 2021 		
T cell engagers	 1st Candidate selected for development Follow-up pipeline established 		
рМНС	 Select Peptides for Candidate Selection – possibly with a partner 		
	Funded into 2023 (Not incl. any future proceeds related to partnerships)		





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