



SurVaxM and Survivin-Targeted Immunotherapy

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MimiVax, LLC is a spin-out company of Roswell Park Comprehensive Cancer Center, Buffalo NY, formed to commercialize the SurVaxM vaccine.

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Trial Development & Implementation, IRB administration



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BioPharm Process
Associates, LLC



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Translational Drug
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Clinical CRO Partner



CMC CDMO Partners

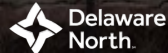


*Contract Consultants

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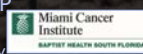
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INVESTORS



Support



NEED

Median Overall Survival for newly diagnosed GBM is 16.0 mos;
Median Progression Free Survival is only 4.0 mos.

No new first line agents approved for GBM in over 20 years
The NCCN treatment guidelines for preferred therapy is
“consider clinical trials”

93.2% of patients will not survive 5 years

Glioblastoma is
a severe unmet
medical need

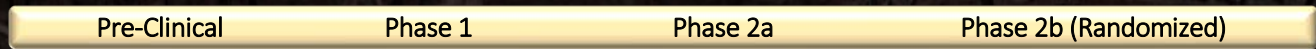
SurVaxM
is a Cancer Vaccine
(immunotherapy)

Final data from the SurVaxM Phase 2a clinical trial for newly diagnosed GBM patients
mOS = 25.9 mos; and mPFS = 11.4 mos.

(Published in the Journal of Clinical Oncology, March 2023)



PIPELINE



SurVaxM
(Cancer Vaccine)

**FDA Orphan Drug Designation*

Partnered with

for development in China



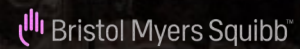
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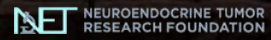
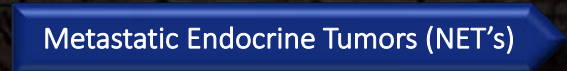
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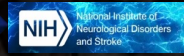


NCT03879694

MV2C2 Antibody
Humanized IgG Camelid sdAb



Roswell Park & George Wash. Univ.



MV209 CAR-T



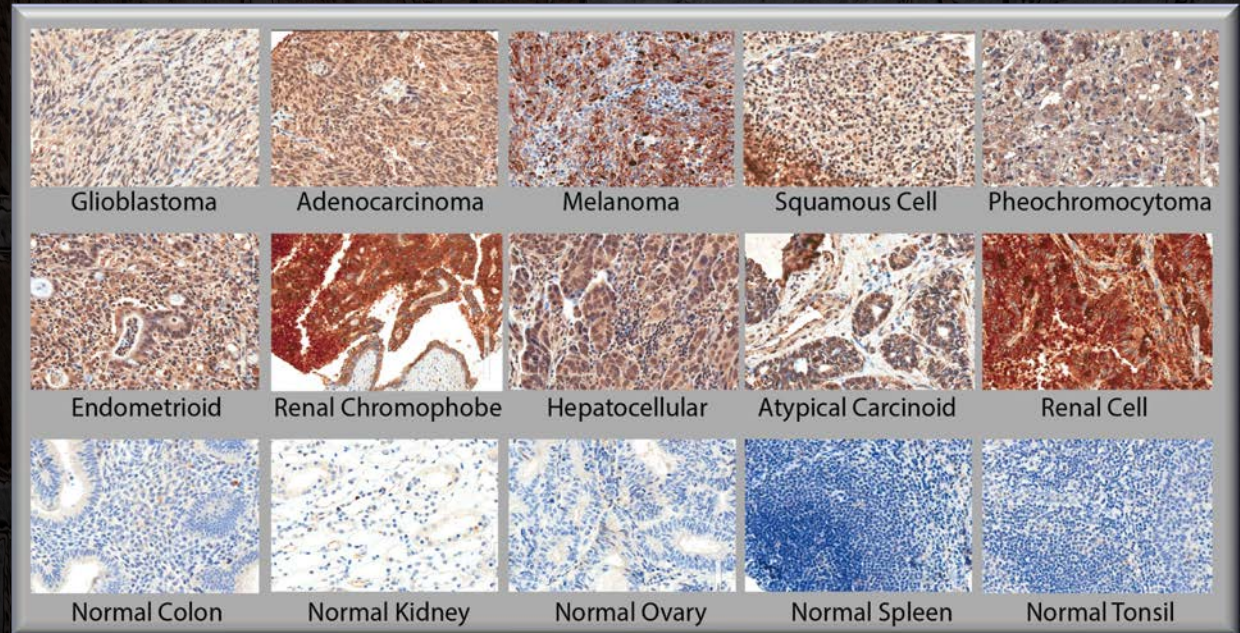
TARGET

- **Survivin is:**

- An over-expressed Pan-Cancer target
- An Onco-fetal protein, typically turned on during fetal development
- Rarely expressed in adult tissues
- Exists as 7 distinct protein isoforms
- Cytoplasmic, Nuclear, Mitochondrial & Cell-Surface expression patterns

- **Survivin functions:**

- Prevents caspase-9 activation
- Regulates p53 & prevents apoptosis
- Silencing leads to cell cycle arrest
- Involved in tubulin assembly and its pathological reorganization



VACCINE

SurVaxM is:

An off-the-shelf immunotherapeutic

Targeted to a key structural epitope of survivin



- 15 AA Structurally-Altered Synthetic Long Peptide (SLP)
- Conjugated to highly immunogenic Keyhole Limpet Hemocyanin (KLH)
- Adjuvants: Montanide & Local GM-CSF (sargramostim)

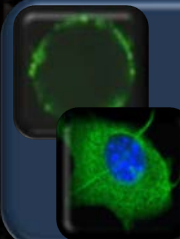
SurVaxM's MOA is:

Both IgG & T-Cell immune-mediated attack

Potential for biological interference by IgG



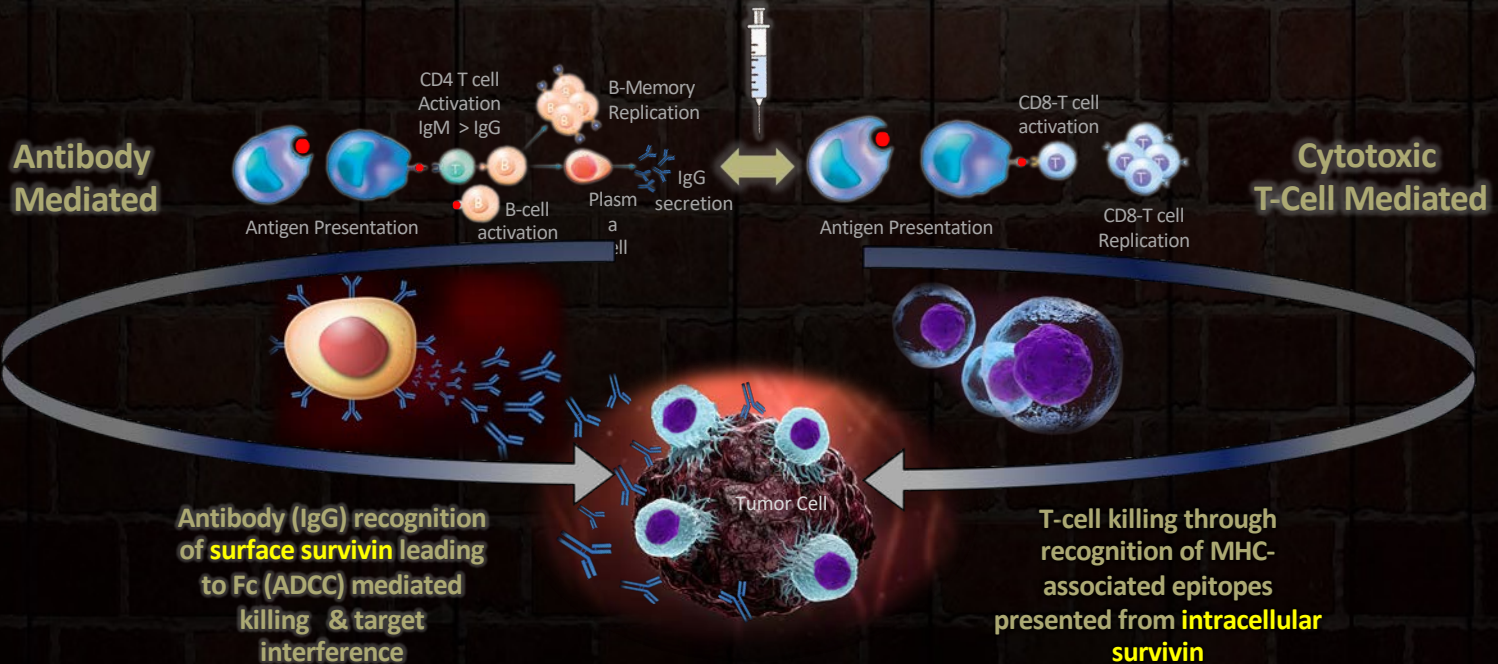
- Dosage: 500µg SurVaxM in Montanide ISA51 VG + 100µg GM-CSF
- Delivered as a Subcutaneous Injection
- 4 initial biweekly doses (q2week x 4)
- Ongoing maintenance dosage once every 2 months (q2month)



- Produces high affinity antibodies (IgG) that target cell-surface survivin
- CD4⁺ & CD8⁺ T-Cells target intra-cellular survivin via MHC-associated epitope presentation

MECHANISM

SurVaxM

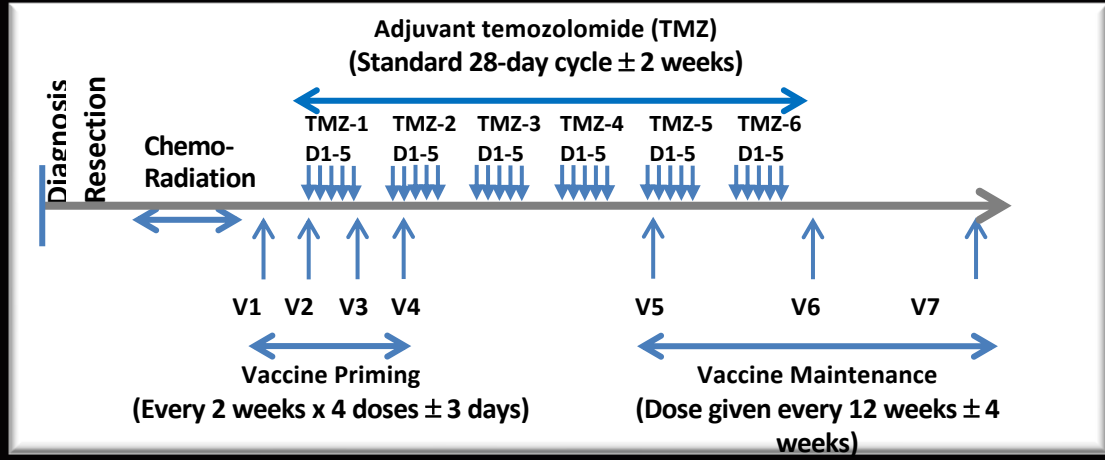


Phase 2a Study of SurVaxM Plus Adjuvant Temozolomide in Newly Diagnosed Glioblastoma

- Single arm, Multi-Center study (5)
- 63 Newly diagnosed GBM Patients enrolled from 2015-2020
- Patients age ≥ 18 years
- Tumor resection with residual enhancement $\leq 1\text{cm}^3$
- 500mcg SurVaxM in Montanide emulsion
- + 100mcg Sargramostim (local injection)
- + Standard-of-care TMZ

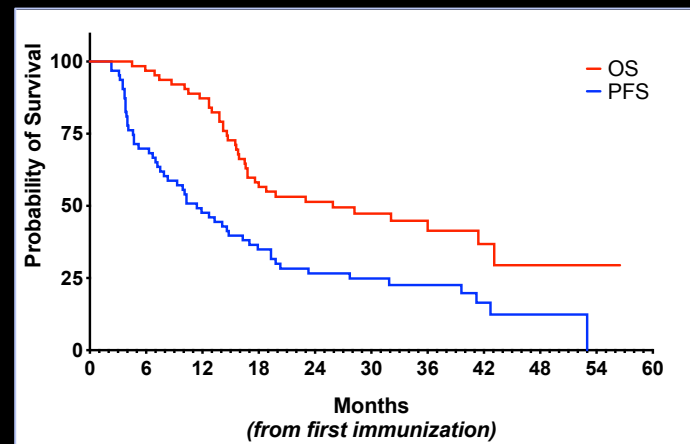
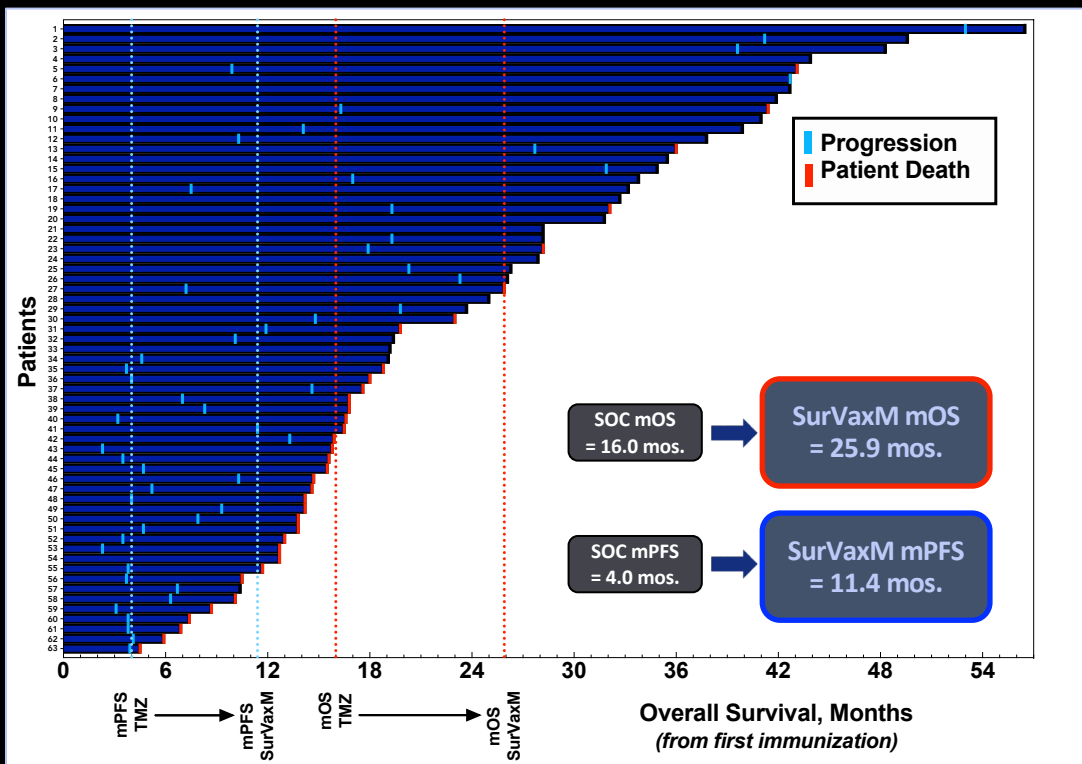


Total patients (n = 63)		
Gender	Male	38 (60%)
	Female	25 (40%)
Age	Mean	56.5
	Median	60
	Range	20-82
KPS score	Median	90
	Range	70-100
MGMT Status	Unmethylated	29 (46%)
	Methylated	33 (52%)
	Unknown	1
IDH status	wt	53 (84%)
	IDH1-R32h	8 (13%)
	Unknown	2
% SVN (IHC)	1-4%	2 (3.2%)
	5-9%	15 (23.8%)
	10-19%	35 (55.6%)
	$\geq 20\%$	12 (19.0%)
Haplotype	A*02/A*02	19 (30.2%)
	A*02/A*03	8 (12.7%)
	A*01/A*02	6 (9.5%)
	A*03/A*03	5 (7.9%)
	A*02/A*24	4 (6.3%)
	A*02/A*11	4 (6.3%)
	A*24/A*24	4 (6.3%)
	Other	13 (20.6%)



RESPONSES

JCO Data 2020



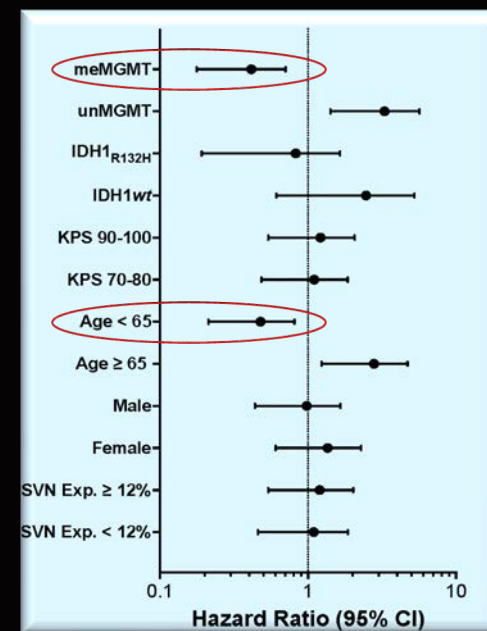
Overall Survival	28.4 mos. from diagnosis 25.9 mos. from 1 st dose
Progression Free Survival	14.4 mos. from diagnosis 11.4 mos. from 1 st dose



Phase 2a Outcomes

	mPFS	95% CI	mOS	95% CI
All patients	11.4	9.9-12.7	25.9	22.5-29.0
un-MGMT	7	5.7-8.2	16.5	13.4-19.3
me-MGMT	17.9	14.7-20.7	41.4	32.1-49.4
	mPFS	95% CI	mOS	95% CI
IDH1wt Only (All)	10.3	8.9-11.6	23	19.8-25.9
un-MGMT/IDH1wt	6.9	5.6-8.0	15.6	12.6-18.3
me-MGMT/IDH1wt	19.3	15.4-22.6	NR (> 41.4)	37.1-59.4 (at 41.4)
	PFS	95% CI	OS	95% CI
All patients: 6 months	69.8%	56.8-79.5	-	-
12 months	47.6%	34.9-59.3	87.2%	76.1-93.4
24 months	26.6%	16.4-37.9	51%	38.3-63.0
36 months	22.6%	12.9-33.9	41.4%	27.8-54.5

Subgroup OS analysis (Cox hazard ratios)



- $p < .01$ for meMGMT patients (HR, 0.36; 95% CI, 0.18-0.71)
- $p < .01$ patients younger than 65 yrs. (HR, 0.41; 95% CI, 0.21-0.81)
- Stratification by IDH1, KPS & survivin-expression was NS

Newly Diagnosed Glioblastoma External Controls for Overall Survival

Study	<i>n</i>	Median OS (months)
Gilbert et al. 2013	411	16.6
Gilbert et al. 2014	309	16.1
Weller et al. 2017	374	17.4
Stupp et al. 2017	229	16.0
Wen et al. 2019	43	15.0
SurVaxM	63	25.9

Newly Diagnosed Glioblastoma External Control for Overall Survival: Stratified for MGMT

Study	meMGMT		unMGMT	
	<i>n</i>	Median OS (months)	<i>n</i>	Median OS (months)
Gilbert et al. 2013	245	21.4	254	14.6
Gilbert et al. 2014	85	25.0	214	14.6
Stupp et al. 2017	77	21.2	95	14.7
Stupp et al. 2005	46	27.7	60	12.7
Stupp et al. 2014	273	26.3	-	-
Herrlinger et al. 2019	63	31.4	-	-
Westphal et al. 2015	-	-	32	15.5
Aggregated (by Alnahhas et al. 2020)	789	24.6	655	14.1
SurVaxM	33	41.4	29	16.5

SAFETY

Patient Safety Profile

Preferred term	Grade 1	Grade 2	Grade 3	Grade 4
Alopecia	1/1 (1.6%)			
Amnesia	2/2 (3.1%)			
Arthralgia	3/3 (4.7%)			
Asthenia		1/1 (1.6%)		
Back Pain	1/1 (1.6%)			
Chills	1/1 (1.6%)			
Confusion			1/1 (1.6%)	
Decreased appetite	1/1 (1.6%)	1/1 (1.6%)		
Fatigue	12/12 (18.8%)	1/1 (1.6%)		
Hyperhidrosis	1/1 (1.6%)			
Hypersensitivity				
Hypertension - aggravated		1/1 (1.6%)		
Influenza-like illness	7/3 (4.7%)			
Injection site haematoma	5/4 (6.3%)			
Injection site induration	5/3 (4.7%)			
Injection site pain	12/9 (14%)			
Injection site pruritus	2/2 (3.1%)			
Injection site reaction	37/24 (37.5%)	3/3 (4.7%)		
Injection site swelling	2/2 (3.1%)			

Preferred term	Grade 1	Grade 2	Grade 3	Grade 4
Lymphopenia	2/2 (3.1%)	6/6 (9.4%)	1/1 (1.6%)	1/1 (1.6%)
Malaise	2/2 (3.1%)			
Myalgia	4/4 (6.3%)	1/1 (1.6%)		
Nausea	1/1 (1.6%)			
Neutrophil count decreased	2/2 (3.1%)	2/2 (3.1%)		1/1 (1.6%)
Panniculitis		2/2 (3.1%)		
Paresthesia	3/3 (4.7%)			
Platelet count decreased	2/2 (3.1%)			
Pruritus	2/2 (3.1%)	1/1 (1.6%)		
Pyrexia	2/2 (3.1%)			
Rash	2/2 (3.1%)	1/1 (1.6%)	1/1 (1.6%)	
Rash maculo-papular			1/1 (1.6%)	
Skin hypertrophy	1/1 (1.6%)			
Subcutaneous nodule	3/3 (4.7%)			
Transaminases increased		1/1 (1.6%)		
Urticaria	1/1 (1.6%)	1/1 (1.6%)		
Leukopenia	4/4 (6.3%)			

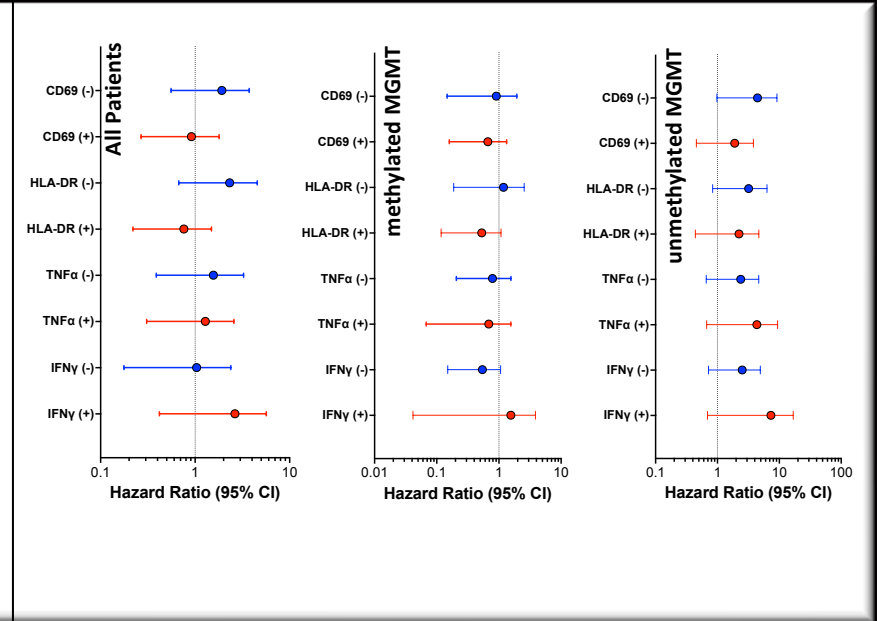
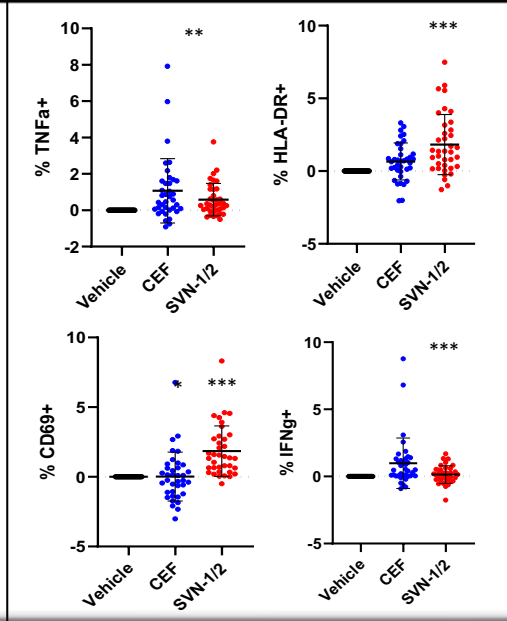
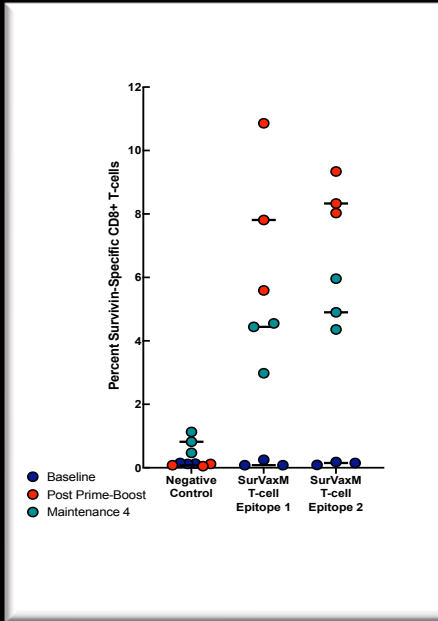
- AE's are inclusive of those attributable to temozolomide

T cell Immune Responses vs. OS

CD8+ T cell responses (MHC-I Dextramers)

CD8+ T Cell responses (to Survivin peptides)

CD8+ T cell correlations for OS (HR)

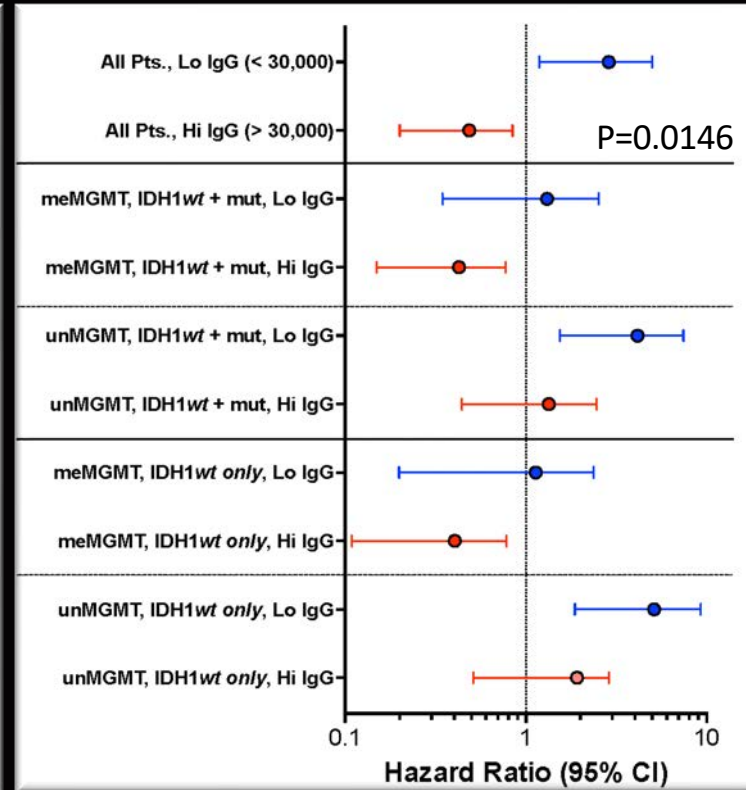
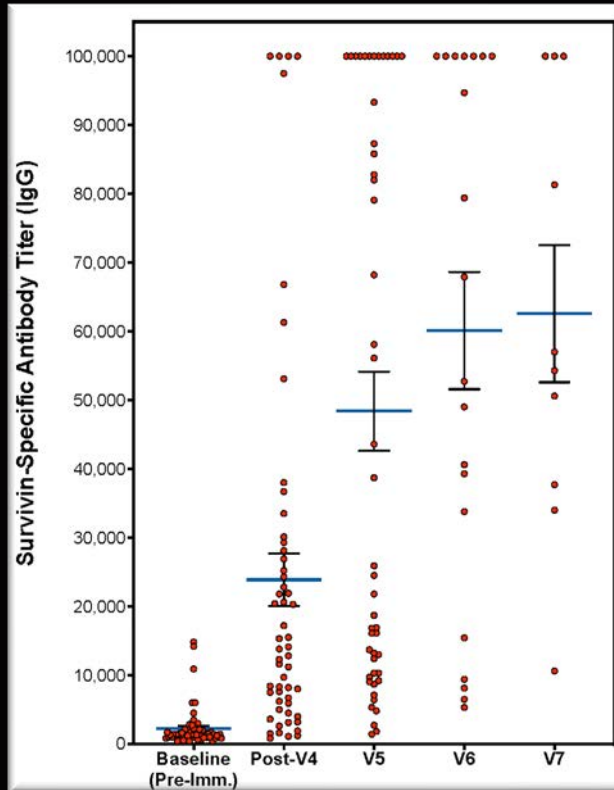


- T Cell responses *while "present"* did not strongly correlate to survival outcome

Anti-SurVaxM IgG vs. OS

anti-SurVaxM IgG titer

Strong Correlation between anti-SurVaxM IgG titer & OS



Stratification by IDH1 and MGMT all showed trends to better OS for higher (> 30,000) IgG

Datapoints represent Cox hazard ratios of OS for each subgroup.

P=0.0146 for patients with IgG responses > 30,000 in titer (HR, 0.41; 95% CI, 0.20-0.84)

SURVIVE

Prospective Randomized Placebo-Controlled Trial of SurVaxM
for Newly Diagnosed Glioblastoma (SURVIVE)

PHASE 2b RCT DESIGN:

NEWLY DIAGANOSSED GLIOBLASTOMA (n=270)

Gross total resection ($\leq 1\text{cm}^3$)
& completed initial Standard of Care therapy
(Same as Phase 2a)

Stratified for MGMT methylation & IDH1 status

RANDOMIZED 3:2

SurVaxM (Arm A)

SurVaxM in emulsion with Montanide
Sargramostim (local injection)
Standard-of-care TMZ

Placebo (Arm B)

Saline in emulsion with Montanide
Saline (local injection)
Standard-of-care TMZ

ENDPOINTS:

- 1° Overall Survival:
 - OS12 (surrogate)
 - mOS (confirmatory)
- 2° Progression Free Survival:
 - mPFS
 - 1st per Central Imaging (RANO)
 - 2nd per PI
- 3° Immune Response & Biomarker Analysis (DNA/RNA)

Now Enrolling at:



...additional sites in process



- Dosing q2w x 4 doses and then q2m until tumor progression or unacceptable toxicity occurs.

First Patient Dosed Q1-2022

- 18-36 mos. follow-up
- Interim Analysis at 100 events
- Sample size adjustment and/or convert to pivotal status

Glioblastoma

Glioblastoma

SurVaxM

Unique MOA

Data Driven
J Clin Oncol
2022 Dec 15;:JCO2200996

Antibody Response

25.9 mos. mOS
11.4 mos. mPFS

27% 5-YSR

16 Long Term (> 4 years) GBM Survivors from Phase 2a

MIMIVA

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SurVaxM & Related References

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