Results of a Phase I/IIa Trial of Combination Whole-Cell Targeted Immunotherapy Vaccine and Checkpoint Inhibitor in Treatment of Metastatic/Recurrent Breast Cancer

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Background:

- Checkpoint inhibitors (CPIs) may be more efficacious in treating metastatic triple negative breast cancer (BC) when given concurrently with vaccine therapy
- SV-BR-1-GM: whole-cell immunotherapy composed of irradiated metastatic BC cells transfected with GM-CSF plasmid
- We conducted a phase I/IIa trial evaluating safety and efficacy of combination SV-BR-1-GM/pembrolizumab in patients with metastatic/recurrent BC

Methods:

- Patient selection: female patients with metastatic/recurrent BC having failed ≥1 line of therapy
- Treatment:
  - Cyclophosphamide 48-72h prior to inoculation
  - SV-BR-1-GM inoculation (10-40x10^6 cells/inoculation)
  - Interferon-alpha-2b on post-inoculation day (PID) 2 and 4
  - Pembrolizumab on either PID 2 or 4
  - Cycles repeated every 3 weeks and continued for up to 24 cycles if no evidence of progression or significant toxicity
  - Imaging repeated every 8-12 weeks to monitor for progression
- Endpoints:
  - Safety
  - Development of delayed type hypersensitivity (DTH) reaction
  - Disease progression

Results:

Table 1: Demographics

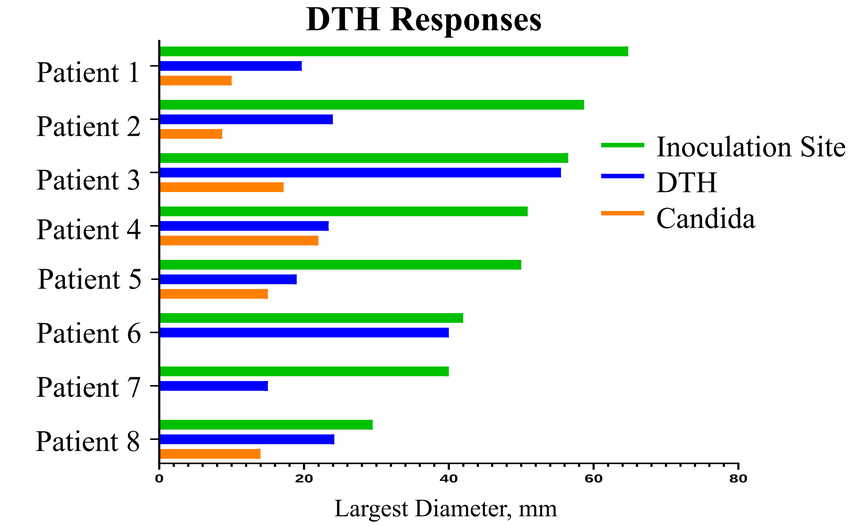
Number of patients enrolled, n	11
Age (yrs), median (IQR)	62 (46, 69)
Prior number of treatment agents received, median (IQR)	9 (6, 12)
Initial cancer receptor status	
ER+, n (%)	6 (54.5)
PR+, n (%)	3 (27.3)
HER2+, n (%)	7 (63.6)
TNBC, n (%)	1 (9.1)

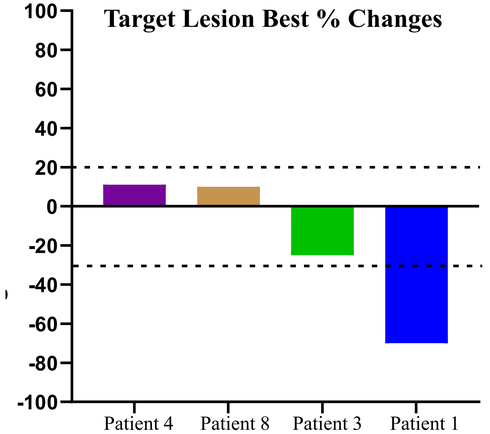
Table 2: Description of Adverse Events

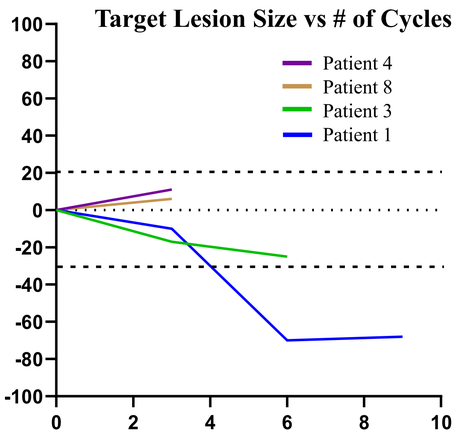
Number of Adverse Events, n	35
Relationship to Study Treatment, n (%)	
Definite	3 (8.6)
Probable	7 (20.0)
Possible	8 (22.9)
Unlikely	2 (5.7)
Unrelated	15 (42.9)
Adverse Event Grade, n (%)	
Grade 1	18 (51.4)
Grade 2	13 (37.1)
Grade 3	4 (11.4)
Grade 4	0 (0.0)
Serious Adverse Event, n (%)	
Yes	2 (5.7)
No	33 (94.3)
Description of Grade 3 Events, n (%)	
Fall	1 (25.0)
Intermittent hyperglycemia	1 (25.0)
Weakness	1 (25.0)
Fatigue	1 (25.0)
Suspected Cause of Grade 3 Events, n (%)	
Cyclophosphamide	4 (100.0)
SV-BR-1-GM	0 (0.0)
Interferon-alpha-2b	0 (0.0)
Pembrolizumab	0 (0.0)

Table 3: Outcomes

Clinical evidence of progression, n (%)	10 (90.9)
Disease-free survival (days), median (IQR)	183 (62, 306)
No clinical evidence of progression, n (%)	1 (9.1)
Duration of follow-up (days)	143







Conclusions: Combination SV-BR-1-GM/pembrolizumab therapy is **safe** and produces a DTH response that may indicate development of **anti-cancer immunity**