In steroid refractory cases, we propose early initiation of steroid sparing immunosuppressive therapy after 3 days.

Consent Written informed consent was obtained from the patient for publication of this abstract and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

http://dx.doi.org/10.1136/jitc-2020-SITC2020.0292

293 RESULTSOF THE FIRST-IN-HUMAN CLINICAL TRIAL WITH PERSONALIZED MULTI-TARGET ADOPTIVE CELL THERAPY (ACTOLOG IMA101)

[1]Apostolia Tsimberidou*, [2]Kerstin Guenther, [3]Amir Alpert, [4]Borje Andersson, [3]Zoe Coughlin, [2]Jens Fritsche, [2]Norbert Hilf, [4]Patrick Hwu, [3]Mamta Kalra, [3]Sabrina Kuttruff-Coqui, [2]Dominik Maurer, [2]Regina Mendrzyk, [3]Ali Mohamed, [4]Becky Norris, [2]Anna Nowak, [4]Rita Ort, [2]Carsten Reinhardt, [2]Fabian Richter, [3]Arun Satelli, [2]Oliver Schoor, [3]Kerry Sieger, [2]Harpreet Singh, [4]David Vining, [2]Claudia Wagner, [2]Toni Weinschenk, [4]Cassian Yee, [3]Steffen Walter. *[1]MD Anderson Cancer Center, Houston, TX, USA; [2]Immatics Biotechnologies GmbH, Tuebingen, Germany; [3]Immatics US, Inc, Houston, TX, USA; [4]UT – MD Anderson Cancer Center, Houston, TX, USA*

Background ACTolog (IMA101) is a personalized multi-target adoptive cell therapy (ACT) approach in which autologous T-cell products are redirected against multiple novel defined peptide-HLA (pHLA) cancer targets identified by the target discovery platform XPRESIDENT®. The primary endpoint was to assess the safety of ACTolog. Secondary endpoints were to assess the in vivo persistence of transferred T-cells and antitumor activity (www.clinicaltrials.gov NCT02876510).

Methods HLA-A*02:01 positive patients with relapsed/refractory solid tumors whose tumor expressed ≥1 cancer target underwent leukapheresis and endogenous T-cells specific for up to 4 targets were primed and expanded in vitro. Patients received lymphodepletion (fludarabine 40 mg/m² and cyclophosphamide 500 mg/m² on days -6 to -3) followed by up to 4×10^{10} cells (day 0), and IL-2 (1×10^6 IU/m² SC twice daily, 14 days) (Cohort 1). In addition, cohort 2 received atezolizumab (1200 mg IV) every 21 days upon hematologic recovery. Infused T-cells were tracked in patients' blood via flow cytometry-based immunomonitoring as well as TCRβ sequencing. TCRs from target specific T-cells were identified from patients' T-cell products and characterized.

Results From 07/2017–03/2020, 214 patients were screened, and 14 heavily pre-treated patients with various tumor types were infused with 1–3 T-cell products each (table 1). The treatment was generally well tolerated. The most common adverse events observed to date were expected cytopenias, mostly attributed to the lymphodepleting regimen, and Grade 1–2 cytokine release syndrome. Prolonged disease stabilization was noted in three patients for 12 months, 12+ months, and 7 months. High frequencies of target-specific T-cells up to 78.7% of CD8+ cells were detected in the blood of treated patients, persisted for >1 year and were detected in post-treatment tumor biopsies. Characterization of individual TCRs contained in T-cell products showed a broad variation of TCR avidities with the majority of TCRs being of low avidity. High-avidity TCRs were identified from products of some patients, including a patient with 26% decrease in tumor measurements 6 weeks post-treatment. Tracking the respective T-cell clonotypes in patients' blood and tumor provides insights into the mechanism of tumor control. Six-month data will be presented at the conference.

Abstract 293 Table 1 Patient pre-treatment characteristics and response assessment

Disposition	**No. of patients (%)**
Screened	214 (100)
HLA-A*02:01 positive	100 (46.7)
Screening tumor biopsy	60 (28.0)
≥1 Target positive	55 (25.7)
Leukapheresis	43 (20.1)
Cohort 1: ACTolog	6 (2.8)
Cohort 2: ACTolog + Atezolizumab	8 (3.7)
Treated total	14 (6.5)
Number of T-cell products received (N=14)	**No. of patients (%)**
1	7 (50.0)
2	3 (21.4)
3	4 (28.6)
Pretreatment characteristics (N=14)	**median (range)**
No. of prior systemic therapies	7 (3-14)
Results (N=14)	**No. of patients (%)**
Response (RECIST 1.1)	
Stable disease	
At 6 weeks post T-cell infusion	11 (78.6)
At 12 weeks post T-cell infusion	6 (42.9)

Conclusions This is the first reported trial demonstrating the feasibility and tolerability of a personalized ACT approach using multiple defined T-cell products directed to multiple precisely defined pHLA cancer targets. These results support further exploration of a multi-target ACT approach, particularly in the context of T-cells expressing high-avidity TCRs to such defined pHLA targets.

Trial Registration https://clinicaltrials.gov/ct2/show/NCT02876510

Ethics Approval The study was approved by WCG WIRB, IRB tracking number 20162235. The study was conducted in accordance with the Declaration of Helsinki and the International Conference on Harmonization Good Clinical Practice guidelines. All the study participants provided written informed consent before enrollment.

Consent Patient consent for publication is not required. Patients consented to participate in the study.

http://dx.doi.org/10.1136/jitc-2020-SITC2020.0293

294 CD8 PET IMAGING OF TUMOR INFILTRATING T CELLS IN ADVANCED SOLID TUMORS: A PHASE I FIRST-IN-HUMAN STUDY OF 89ZR-IAB22M2C, A RADIOLABELED ANTI-CD8 MINIBODY

[1]Michael Farwell*, [1]Raymond Gamache, [2]Neeta Pandit-Taskar, [2]Mike Postow, [3]Michael Gordon, [4]Ian Wilson, [4]Alessandro Mascioni, [5]Anna Wu, [4]William Le, [4]Avital Weiss, [4]Ronald Korn. *[1]University of Pennsylvania, Philadelphia, PA, USA; [2]Memorial Sloan Kettering Cancer Center, New York, NY, USA; [3]HonorHealth Research Institute, Scottsdale, AZ, USA; [4]ImaginAb, Ingelwood, CA, USA; [5]City of Hope, Duarte, CA, USA*

Background Tumor infiltration by CD8 T cells is associated with favorable outcomes to immunotherapy (IOT). However, biopsies to assess T cell infiltration are invasive and prone to sampling error. CD8 PET imaging could provide an effective non-invasive method of visualizing T cell trafficking and tumor infiltration and predicting early response to IOT.

Methods A phase 1 first-in-human PET imaging study using an anti-CD8 radiolabeled Minibody, 89Zr-IAB22M2C (CD8-tracer), to detect whole body and tumor CD8 distribution in patients with metastatic solid tumors was completed. Patients received 3 mCi 89Zr-IAB22M2C followed by serial PET scans over a 5–7-day period. A two-stage design included protein dose escalation phase[1] (n=6, 0.2 mg to 10 mg API) to