Morphomics Predicts Response to Ipilimumab in Patients with Stage IV Melanoma.

INTRODUCTION
Factors predictive of response to immunotherapy are needed to select appropriate patients. As morphometric analysis can be an objective surrogate for underlying physiology, we explored the possibility that morphomics may predict response among stage IV melanoma patients treated with ipilimumab.

METHODS
We identified stage IV melanoma patients treated with ipilimumab who had an appropriate CT scan within a 6 month window. Using semi-automated algorithms, we acquired several morphomic measurements. Toxicity and response rate compared by quartile using Fisher's exact test or chi-square, while survival after initiation of ipilimumab was compared by quartile using the log-rank test.

RESULTS
While there was a significant correlation between toxicity and response (P<0.003), morphomics failed to predict either severity of toxicity or specific side effects. Psoas density was significantly associated with response rate, both excluding stable disease (36.4% vs 9.1%, P=0.054), and including stable disease (54.5% versus 18.2%, P=0.045). Survival after initiation of ipilimumab was significantly associated with psoas density (P= 0.04) and visceral fat distance (P= 0.022).

DISCUSSION
In an exploratory study of patients with metastatic melanoma being treated with ipilimumab, psoas density and spine-fascia distance correlated with response and survival. Pre-treatment morphomic analysis, as a correlate of underlying physiology, may help predict response to immunotherapy.