Lymphoma patients enrolled receive RT as bridging before chimeric antigen receptor (CAR) T cell therapy. Each dose is followed by a smaller PET in the region of interest. Eligible patients have no change in systemic treatment within 2 months prior to RT and no splenic disorders. Here, we present the results of our first four patients.

Our pilot study (NCT05371132) uses Zr-89-crefmlimab to assess the immune response to radiation with serial inter-fraction CD8 ImmunoPET imaging to evaluate the immune response to radiation therapy (ELIXR) throughout entire tumors and the whole body. Preliminary results of a prospective pilot study using CD8 ImmunoPET imaging to evaluate the immune response to radiation therapy (ELIXR)...

*Background*

- Radiation therapy (RT) may produce immunomodulatory effects that can synergize with immunotherapy, but the immune response to radiation within the heterogeneous tumor microenvironment is poorly understood.
- Tumor accumulation of cancer-killing cytotoxic CD8+ T cells is correlated with response and survival.
- Zr-89-crefmlimab is a radiolabeled CD8+ minibody that can image CD8+ T cell distribution throughout entire tumors and the whole body.

*Methods*

- Optimal scans occur at 24 hours post-infusion, but the half-life of the tracer agent (~3 days) enables scans to be taken at multiple timepoints up to one week post-infusion.
- Increased activity during and after RT.
- Maximum standardized uptake values (SUV\text{max}) of lesions are extracted from all tumors, both target and non-target, in each CD8 ImmunoPET scan.

**Results**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Treatment</th>
<th>Concurrent Therapy</th>
<th>Baseline SUV\text{max}</th>
<th>Peak SUV\text{max}</th>
<th>Timepoint of peak activity</th>
<th>Response to date</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Lung</td>
<td>XL092</td>
<td>1.3</td>
<td>5.2</td>
<td>4th RT fraction</td>
<td>47% decrease</td>
</tr>
<tr>
<td>P2</td>
<td>Right shoulder</td>
<td>Cabozantinib</td>
<td>6.8</td>
<td>19.0</td>
<td>Post-RT</td>
<td>13% decrease</td>
</tr>
<tr>
<td>P3</td>
<td>Subcapsular lymph node</td>
<td>Nivolumab</td>
<td>6.8</td>
<td>19.4</td>
<td>4th RT fraction</td>
<td>49% decrease</td>
</tr>
</tbody>
</table>

**Conclusion**

- In P4, peak increase in SUV\text{max} was 1.2 and 2.7 in the left and right leg target lesions, respectively (Fig. 2).
- Two non-target lesions proximal to the left leg target lesion that received ~1% of the dose achieved an increase in SUV\text{max} of 1.2 and 1.7 during radiation. Both resolved post-RT pre-CAR T.
- CD8 ImmunoPET taken 7 days post-CAR T infusion did not demonstrate any significant CD8 PET signal.
- All lesions resolved by day 30 post-CAR T on FDG PET imaging.