Cancer Immunotherapy: immune checkpoint inhibitors, cancer vaccines, and adoptive T-cell therapies - Overview

Description: This report focuses on the rising potential for the newest and most promising of cancer treatments: cancer immunotherapy. Cancer immunotherapy was once just a dream in the minds of physicians, clinicians and patients, but only recently (2010s era) has it actually been within reasonable reach. Cancer Immunotherapy: immune checkpoint inhibitors, cancer vaccines, and adoptive T-cell therapies covers three principle therapies that have been in the works for cancer patients.

One principle therapy that has been on the rise is checkpoint inhibitors. Checkpoint inhibitors are a class of monoclonal antibodies that inhibit pathways responsible for blocking the response of T-cells to antigens. Not only have results from clinical trials of these therapeutics been promising, but treatments have already been approved both in the U.S. and Europe for metastatic melanoma. There are several agents and targets covered in this section, including the September 5, 2014 approval of Merck's PD-1 inhibitor: pembrolizumab (Keytruda), as well as the future outlook of potential combination checkpoint inhibitor therapies.

Another principle therapy under investigation are anticancer vaccines. This is another major strategy surfacing in cancer therapeutics and, unlike traditional vaccines which are given to prevent illness (i.e. smallpox, measles, and pertussis), these vaccines are given to patients who already have cancer and are designed to elicit an antitumor response to even the most aggressive of cancers. Though this is a theoretically good approach to combat cancer, there have been an unfortunate number of clinical failures and the industry has gained only one U.S. approved anticancer vaccine. Combination therapies are also a possible route these vaccines will take in the future.

Finally, the last therapy addressed in this report is adoptive cellular immunotherapy. Adoptive cellular immunotherapy is when syngeneic activated T-cells are infused in patients to attack their cancers. There are a few types of cellular immunotherapies including: tumor infiltrating lymphocyte (TIL) therapy, genetically engineered T cells bearing chimeric antigen receptors (CARs), and recombinant TCR technology. Improving these therapies is the goal over the next few years and researchers have been working heavily to commercialize these products and technologies.

The report is further coupled with an in-depth introduction and history as well as with data for market outlook. Also featured in this report are exclusive interviews with three high-end professors, researchers and CEOs:

- Adil Daud, MD, Clinical Professor, Department of Medicine (Hematology/Oncology), University of California at San Francisco (UCSF); Director, Melanoma Clinical Research, UCSF Helen Diller Family Comprehensive Cancer Center.

- Matthew Lehman, Chief Executive Officer, Prima BioMed (a therapeutic cancer vaccine company with headquarters in Sydney, Australia).

- Marcela Maus, MD, PhD, the Director of Translational Medicine and Early Clinical Development, Translational Research Program, Abramson Cancer Center, University of Pennsylvania in Philadelphia.

Furthermore, survey was conducted which analysed the data representing a population sample from the R&D industry. This survey depicts market outlook, and portrays industry opinions and perspectives.

Contents: Executive Summary
Checkpoint inhibitors
Therapeutic anticancer vaccines
Adoptive immunotherapy for cancer
- TIL therapy
- Adoptive immunotherapy with genetically engineered T cells bearing chimeric antigen receptors (CARs)
- Recombinant TCR technology
CHAPTER 1: Introduction
The early history of cancer immunotherapy
Cytokines as immunomodulatory drugs
- Interleukin-2
- Alpha-interferons
- Interleukin-12
- Interleukin-12 as a bridge between innate and adaptive immunity
- Investigation of interleukin-12 as an anticancer therapeutic

CHAPTER 2: Checkpoint Inhibitors
What are immune checkpoints?
CTLA-4 blocking agents
- Ipilimumab
- Tremelimumab
PD-1 blocking agents
- Nivolumab
- Nivolumab in NSCLC
- Combination therapy of nivolumab plus ipilimumab in melanoma
- Pembrolizumab (Merck's Keytruda)
- PD-L1 expression as a biomarker for response to pembrolizumab in melanoma and in NSCLC
- Merck's strategy for development and approval of pembrolizumab
- Other anti-PD-1 agents
PD-L1 blocking agents
- Roche/Genentech's MPDL3280A
- MPDL3280A in NSCLC
- MPDL3280A in urothelial bladder cancer
- MedImmune/AstraZeneca's MEDI4736
- Medarex/BMS's MDX-1105

Are there other clinical-stage checkpoint inhibitors on the horizon?
Discussion of the Adil Daud interview
Conclusions
Interview with Adil Daud, MD

CHAPTER 3: Therapeutic anticancer vaccines
Introduction
Cancer vaccines- a field rife with clinical failures
- Why has the cancer vaccine field been so prone to clinical failure?

Marketed and selected late-stage cancer vaccines in development
- Dendreon's sipuleucel-T (APC8015, Provenge)
- Talmogene laherparepvec (Amgen's T-Vec)
- Celldex' rindopepimut (CDX-110)
- Tecemotide (Oncothyreon/Merck Serono)
- PROSTVAC-VF (Bavarian Nordic)
- AGS-003 (Argos Therapeutics)
- CVac (Prima BioMed)
- Cancer vaccine failure the result of poor clinical trial design?

Conclusions
Interview with Matthew Lehman
CHAPTER 4: Adoptive Immunotherapy for Cancer

Introduction
Adoptive immunotherapy with tumor infiltrating lymphocytes (TILs)

- A specific immunodominant mutation in a melanoma patient who had a durable complete remission due to TIL therapy
- Adoptive immunotherapy based on mutation-specific CD4+ T cells in an epithelial cancer
- Commercializing TIL therapy

Adoptive immunotherapy with genetically engineered T cells bearing chimeric antigen receptors (CARs)

- University of Pennsylvania/Novartis’ CD19-targeting CAR T-cell therapy CTL019 (formerly CART19)
- Pilot studies of CTL019
- Later studies of CTL019
- Commercialization of CTL019 therapy
- The Marcela Maus interview and CTL019
- Juno Therapeutics’ 19-28z CD19-targeting CAR T-cell therapy
- Serum cytokine levels and safety of 19-28z CAR T-cell immunotherapy
- Efficacy of 19-28z CAR T-cell therapy in patients with CD19+ malignancies
- Can CAR T-cell therapy be applied to treatment of solid tumors?
- CAR T-cell therapy targeting mesothelin on malignant pleural mesothelioma and pancreatic cancer
- CAR T-cell therapy targeting GD2 on neuroblastoma
- Other companies developing CAR-based immunotherapies

Recombinant TCR technology

- Adaptimmune
- Autologous recombinant TCR therapies under investigation in Dr. Steven Rosenberg’s group at the NCI

Market issues
Interview with Marcela Maus, MD, PhD

CHAPTER 5: Summary and Conclusions

Checkpoint inhibitors
Therapeutic anticancer vaccines
Adoptive immunotherapy for cancer

- TIL therapy
- Adoptive immunotherapy with genetically engineered T cells bearing chimeric antigen receptors (CARs)
- Recombinant TCR technology
- The future of adoptive immunotherapy for cancer

Insight Pharma Reports survey on cancer immunotherapy

Outlook for cancer immunotherapy

References
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct and select the format(s) you require.

- Product Name: Cancer Immunotherapy: immune checkpoint inhibitors, cancer vaccines, and adoptive T-cell therapies - Overview
- Web Address: http://www.researchandmarkets.com/reports/3066973/
- Office Code: SC

Product Formats
Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Product Format</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic (PDF) -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single User:</td>
<td></td>
<td>USD 2495</td>
</tr>
<tr>
<td>Electronic (PDF) -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site License:</td>
<td></td>
<td>USD 3995</td>
</tr>
<tr>
<td>Electronic (PDF) -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprisewide:</td>
<td></td>
<td>USD 9950</td>
</tr>
</tbody>
</table>

* The price quoted above is only valid for 30 days. Please submit your order within that time frame to avail of this price as all prices are subject to change.

Contact Information
Please enter all the information below in BLOCK CAPITALS

- Title: [Mr] [Mrs] [Dr] [Miss] [Ms] [Prof]
- First Name: __________________________  Last Name: __________________________
- Email Address: * __________________________
- Job Title: __________________________
- Organisation: __________________________
- Address: __________________________
- City: __________________________
- Postal / Zip Code: __________________________
- Country: __________________________
- Phone Number: __________________________
- Fax Number: __________________________

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information
Please indicate the payment method you would like to use by selecting the appropriate box.

- Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

- Pay by check: Please post the check, accompanied by this form, to:
  Research and Markets,
  Guinness Center,
  Taylors Lane,
  Dublin 8,
  Ireland.

- Pay by Wire Transfer: Bank details will be provided on the invoice which you will receive after you place your order with us.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:
(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World