AVEO ONCOLOGY
The Human Response

2014 Strategic Plan

MARCH 13, 2014

Forward-Looking Statements

This presentation contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this presentation are forward-looking statements. The words “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “plan,” “predict,” “project,” “target,” “potential,” “will,” “would,” “could,” “should,” “continue,” “contemplate,” or the negative of these terms or other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These forward-looking statements include, among others, statements about: AVEO’s estimates for its 2014 year-end cash balance and cash estimates through 2015; AVEO’s goals and business strategy and its ability to optimize its resources; its approach to treat cachexia, including the potential therapeutic advantages and benefits of its AV-380 program and the potential opportunities for the treatment of cachexia beyond cancer; the timing and results of preclinical and clinical trials; and AVEO’s plans to pursue strategic partnerships for certain of its assets.

Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make due to a number of important factors, including risks and uncertainties relating to: our ability to successfully develop, test and gain regulatory approval of our product candidates; our ability to obtain necessary financing; our ability to establish and maintain new strategic partnerships; our ability to obtain, maintain and enforce intellectual property rights; competition; our dependence on our strategic partners and other third parties; adverse economic conditions; and those risk factors discussed in the “Risk Factors” and elsewhere in our Annual Report on Form 10-K that was filed with the Securities and Exchange Commission (“SEC”) on March 13, 2014, and other periodic filings we make with the SEC. All forward-looking statements contained in this presentation speak only as of the date of this presentation, and we undertake no obligation to update any of these statements, except as required by law.

Focus over the last 8 months

- Strengthen balance sheet
- Re-assess internal pipeline assets
- Develop forward strategy

Strengthened Balance Sheet

- Reduce cash burn
  - Headcount reduction
    - Restructuring of 62% implemented in June 2013
    - Additional ~10% reduction over last 6 months as tivozanib-related activities wind down
  - Operating expenses run rate cut by half:
    - R&D expenses by 51% (4Q2013 vs 4Q2012)
    - G&A expenses by 52% (4Q2013 vs 4Q2012)
- Yearend 2013 financial results
  - $118.5M in cash, cash equivalents and marketable securities
  - Nimble organization leveraging external resources to complement internal capabilities
- Enabling execution of our forward strategy
  - Anticipated 2014 yearend cash of $50-55M
    - Projection does not including potential for additional capital from business development or other strategic initiatives

Assessment of Our Internal Pipeline

- Tivozanib
  - Discontinued studies of tivozanib in colorectal and triple negative breast cancers
  - Astellas partnership terminated
- Ficlatuzumab
  - Identified a biomarker for select patients with non-small cell lung cancer (NSCLC) who potentially benefit from combination of ficlatuzumab with an approved EGFR TKI
- AV-203
  - Completed Phase 1 dose escalation study
- AV-380
  - Initiated development for first-in-class program targeting GDF-15

Developed AVEO's Forward Strategy

Strategy

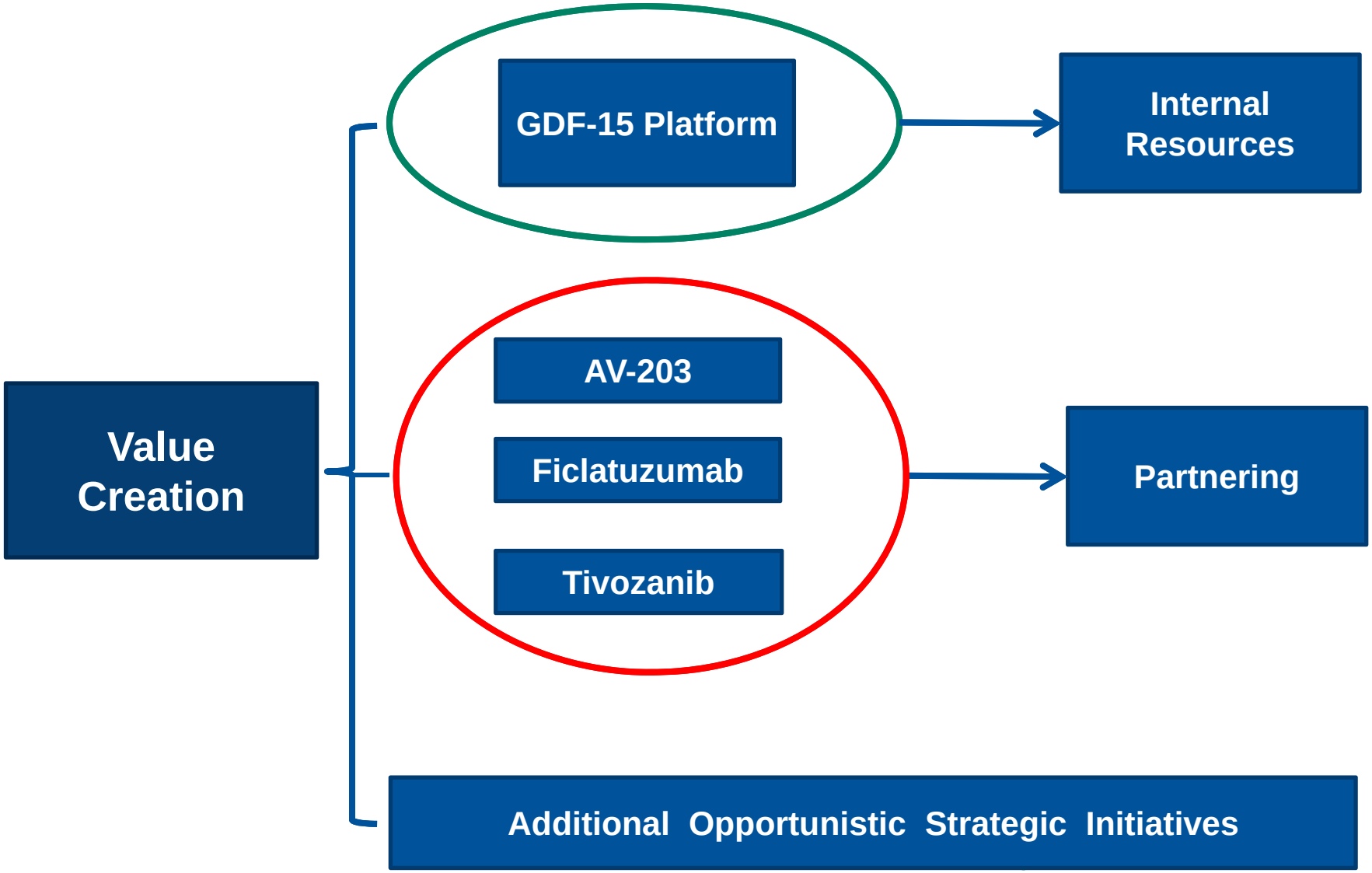
- Focus internal resources (human, platform and financial) to advance potential first-in-class opportunities
  - Address diseases where no other therapies exist and/or where there is a well-defined patient population with clear unmet medical needs
  - Provide clear path to proof-of-concept and approval with reasonable probabilities of success
  - Pursue programs that can deliver value within projected financial framework

- Utilize external resources via collaborations to develop clinical stage assets

A Strategy Based on AVEO's Core Values

Leveraging our innovative science and unique biological insights to meaningfully impact the lives of people with cancer

A Strategy Focused on Value Creation



Clinical Stage Assets
Value to be Realized through Partnerships

AV-203: ErbB3 Inhibitory Antibody

Clinical Status

- Phase 1 dose-escalation study completed; AV-203 well-tolerated and recommended Phase 2 dose identified
- Data to be presented at 2014 medical meeting
- CLIA validation completed for patient selection biomarker with response observed in biomarker positive patients
- Single agent expansion cohort discontinued

Development Plans

- Pursue external collaboration to advance clinical development subject to our ability to regain certain rights from Biogen Idec

Ficlatuzumab: c-Met/HGF Inhibitory Antibody

Clinical Status

- Phase 2 study of ficlatuzumab in combination with gefitinib vs. gefitinib monotherapy in NSCLC completed in 2012
- Exploratory analysis identified a patient subpopulation deriving benefit from ficlatuzumab - EGFR TKI combination using commercial serum-based molecular diagnostic test
- Data to be presented in 2014 medical meeting

Development Plans

- Ongoing evaluation of external collaboration opportunities to advance clinical development

Tivozanib: Triple VEGFR Inhibitory Small Molecule

Clinical Status

- Wind down discontinued trials of tivozanib in RCC, colorectal and triple negative breast cancers
  - ~150 patients elected to remain on study (primarily RCC & CRC)
  - Remaining committed costs shared 50/50 with Astellas (AVEO costs of ~$12M in 2014)
- Biomarker data from CRC study to be presented at 2014 medical meeting

Development Plans

- Continue support for on-going ISTs
- Regain worldwide rights in August 2014 following Astellas agreement termination
- Evaluate external collaboration to advance clinical development

AV-380 in Cachexia

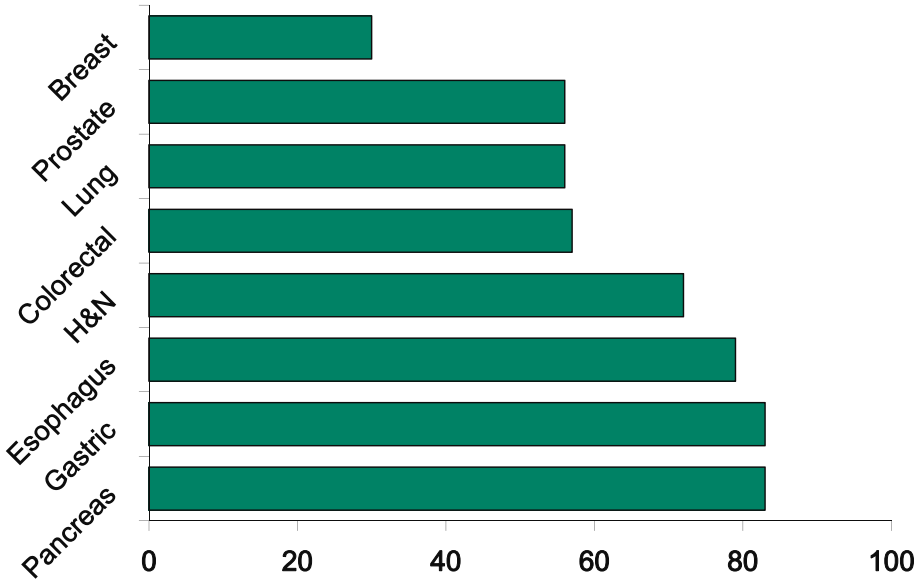
A Major Opportunity

What is Cachexia and Who Does it Affect?

Cachexia: Complex metabolic syndrome associated with several underlying chronic illnesses and characterized by loss of muscle mass and strength, loss of whole body fat, inflammation, anemia, etc.

~400,000 cancer cachexia patients in U.S. [2]

% prevalence of weight loss by tumor[1]



1. Laviano A and Meguid MM; *Nutrition* 1996; 12:358-37
2. Morley et al*; Am J Clin Nutr 2006*

GDF-15 – Key Mediator of Cancer Induced Cachexia

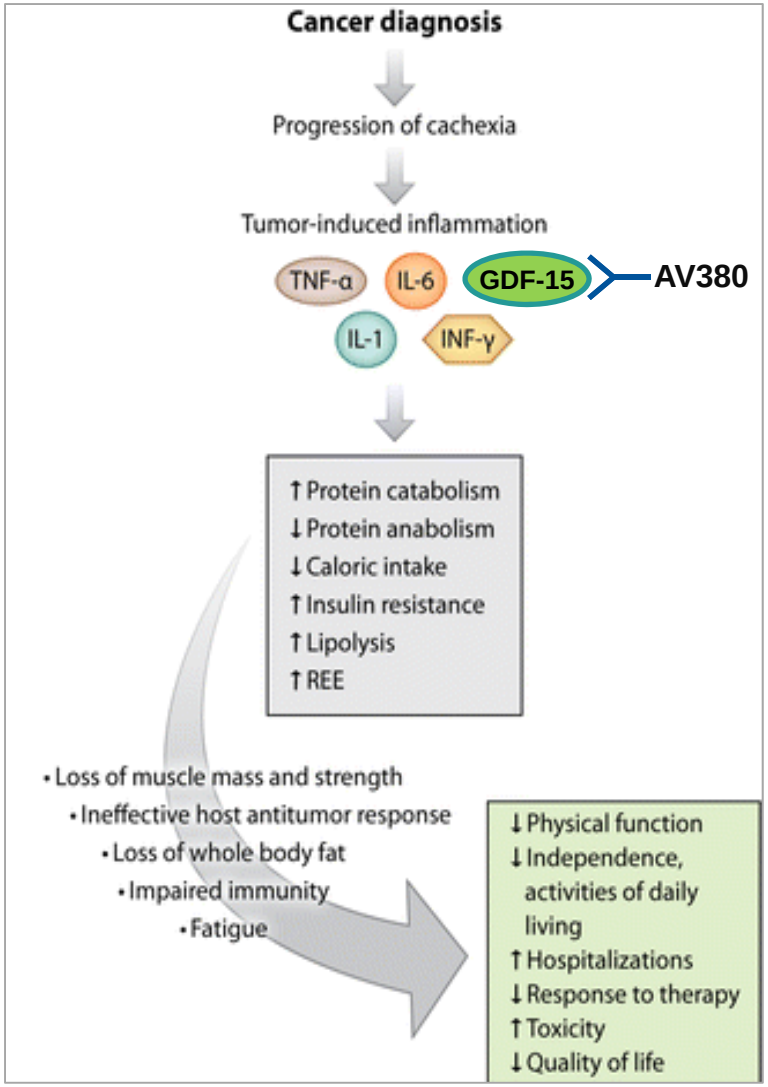
- Discovered through AVEO's Human Response Platform™
  - Key tumor signaling pathway identified whose activation triggers a genetic program that results in cachexia
  - GDF-15 identified as the key mediator
  - GDF-15 is a soluble factor found in serum/plasma; it is a divergent member of the TGF-beta family

- Significant experimental validation links GDF-15 to the onset of cachexia
  - **Correlation**[1,2] - elevated levels of plasma GDF-15 correlate with the cachexia phenotype in animal models and in cancer patients
  - **Gain of function**[1,2] - elevated circulating GDF-15 levels cause cachexia in animal models
  - **Loss of function**[3] - inhibition of GDF-15 reverses body weight loss in cachectic tumor models

- Exclusive worldwide IP position
  - Composition of Matter Pending – valid until 2033
  - Method of Treating Certain Symptoms Associated with Cachexia
    - US Patent issued – valid until 2029
    - EU Application Pending – valid until 2025

1. Johnen H et al. (2007): *Nature Medicine*, 13: 1333-1340
2. AVEO data presented at 2013 Cancer Cachexia Conference, 2013 AACR Annual Meeting
3. AVEO data to be presented at scientific meeting in 2014

AV-380 – A First-in-Class Opportunity

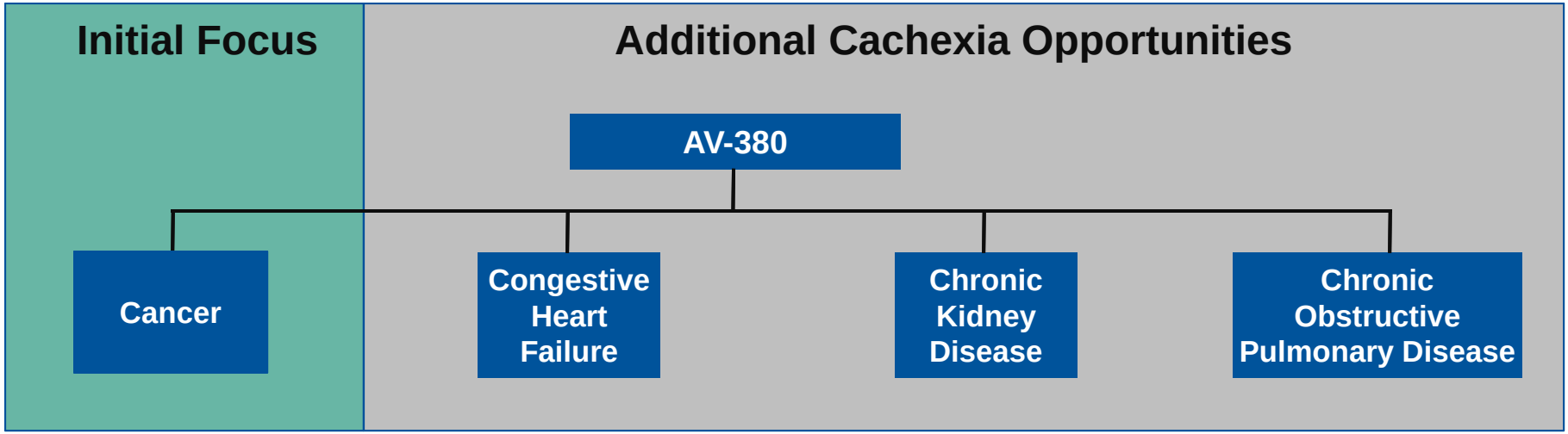


Dodson et al; Ann Rev Med, 2011

- AV-380: Potent humanized GDF-15 inhibitory Mab
  - Unique mechanism of action that addresses multiple, key underlying mechanisms of cachexia with the potential to
    - **Increase** calorie/food intake
    - **Reverse** body weight loss
    - **Restore** normal body composition
- Mechanism of action different from
  - Hormonal/Metabolic agents (i.e. ghrelin, SARMs)
    - Focus on stimulation of appetite or muscle protein synthesis
  - Muscle regulation-directed agents (i.e. myostatin, activin)
    - Address the muscle wasting aspect of the diseases
  - Early cytokine inhibitors (i.e.TNFα,IL-6, IL-8)
    - Mechanistic link to the disease not well established

Potential Beyond Cancer Cachexia

~5M patients suffering from muscle wasting in the U.S.[1]



1. Morley et al; *Am J Clin Nutr* 2006;83:735– 43

AV-380 – Program Status

- Development initiated in Q3, 2013
- 2014 program goals
  - Completion of GMP manufacturing (Q3)
  - Pre-IND meeting to garner FDA feedback on POC development plan (Q4)
  - Evaluate opportunities to realize value beyond cancer cachexia
- IND planned for 2H, 2015

Additional Opportunistic Strategic Initiatives

Value Creation through Additional Strategic Initiatives

Continue to evaluate opportunities to leverage existing financial resources and/or internal capabilities to

- Acquire/in-license compound that meets our strategic criteria
  - clear unmet medical need
  - clear path to POC and approval
  - value inflection points within defined financial parameters
- Accelerate value creation opportunities

Summary

Focused Deployment of Resources to Create Value

Financially strong with cash runway to support current operating plan

- Invest:
  - AV-380
    - Continue to advance development toward IND by 2H, 2015
    - Evaluate external opportunities to realize value beyond cancer
- Partner:
  - AV-203
    - Pursue external collaborations to advance clinical development, subject to our ability to regain certain rights from Biogen Idec
  - Ficlatuzumab
    - Evaluate external collaborations to advance clinical development
  - Tivozanib
    - Wind down tivozanib studies and regain rights from Astellas
    - Evaluate external collaborations for further development
- Evaluate
  - Additional strategic initiatives - access compounds with potential to further accelerate value creation