

Palm Tocotrienols - Overcoming Hurdles & Establishing New Frontiers

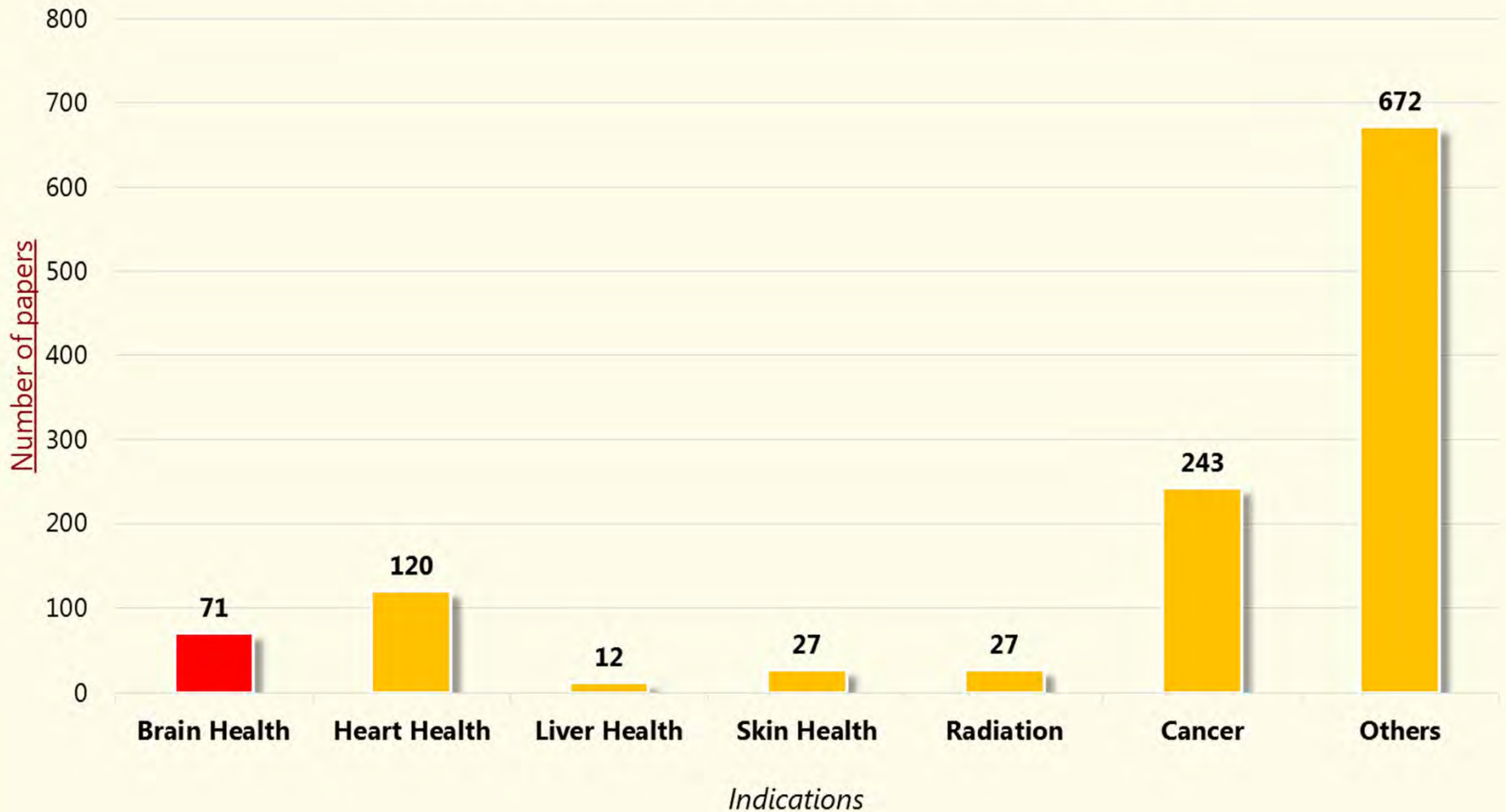


David Ho

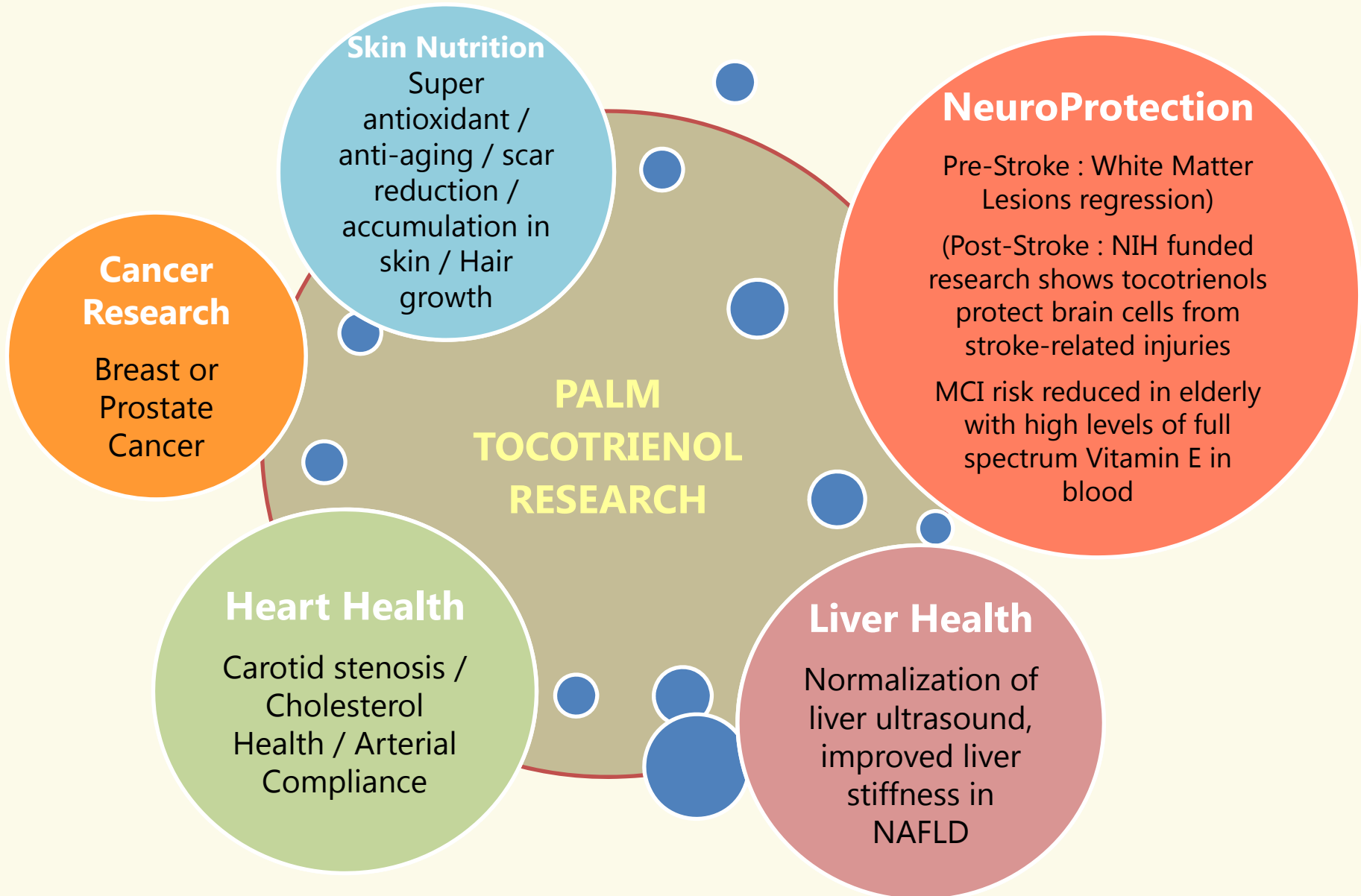
Hovid Berhad, Malaysia

Number of Published Research Papers in Key Health Areas

Number of Published Research Papers
(Pubmed, total on tocotrienols = 1172 as at 22 July 2015)

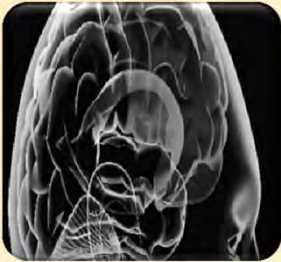


Key Research Areas for Tocotrienols



Mechanisms of Action

Brain Health



Via Non-antioxidant effect– regulates key checkpoints to minimize neuronal cell degeneration and death; induces arteriogenesis & increases secondary blood supply to stroke-affected area.

Via Antioxidant effect

Heart Health



- Regulates down-degradation of HMG CoA-Reductase
- Reversal of arterial blockage in carotid stenosis patients
- Improve arterial stiffness
- Potent antioxidant property

Liver Health



- NAFLD/Liver stiffness
- Anti-inflammatory function

Skin Health



- Antioxidant, anti-aging, anti-inflammatory functions
- Preferential accumulation in strata-corneum of skin

Cancer



- Growth arrests, anti-proliferative & apoptotic effects.
- Suppression of carcinogenesis.
- Potent antioxidant property – free radical scavenging

Radiation Protection



- Potent antioxidant activity (ROS and RNS scavenging)
- Growth arrests, anti-proliferative and apoptotic effects.

New Frontiers for Tocotrienol Research

- Human trial data are supportive of cosmetic and supplement market only
- Solid science and positive human data are emerging to support taking tocotrienols to the **pharmaceutical arena**
- Large scale FDA approved **human trials** next hurdle
- More detailed and demanding **safety** and **toxicology** data mechanisms and **pharmacokinetic** studies may be required

New Frontiers of the Research

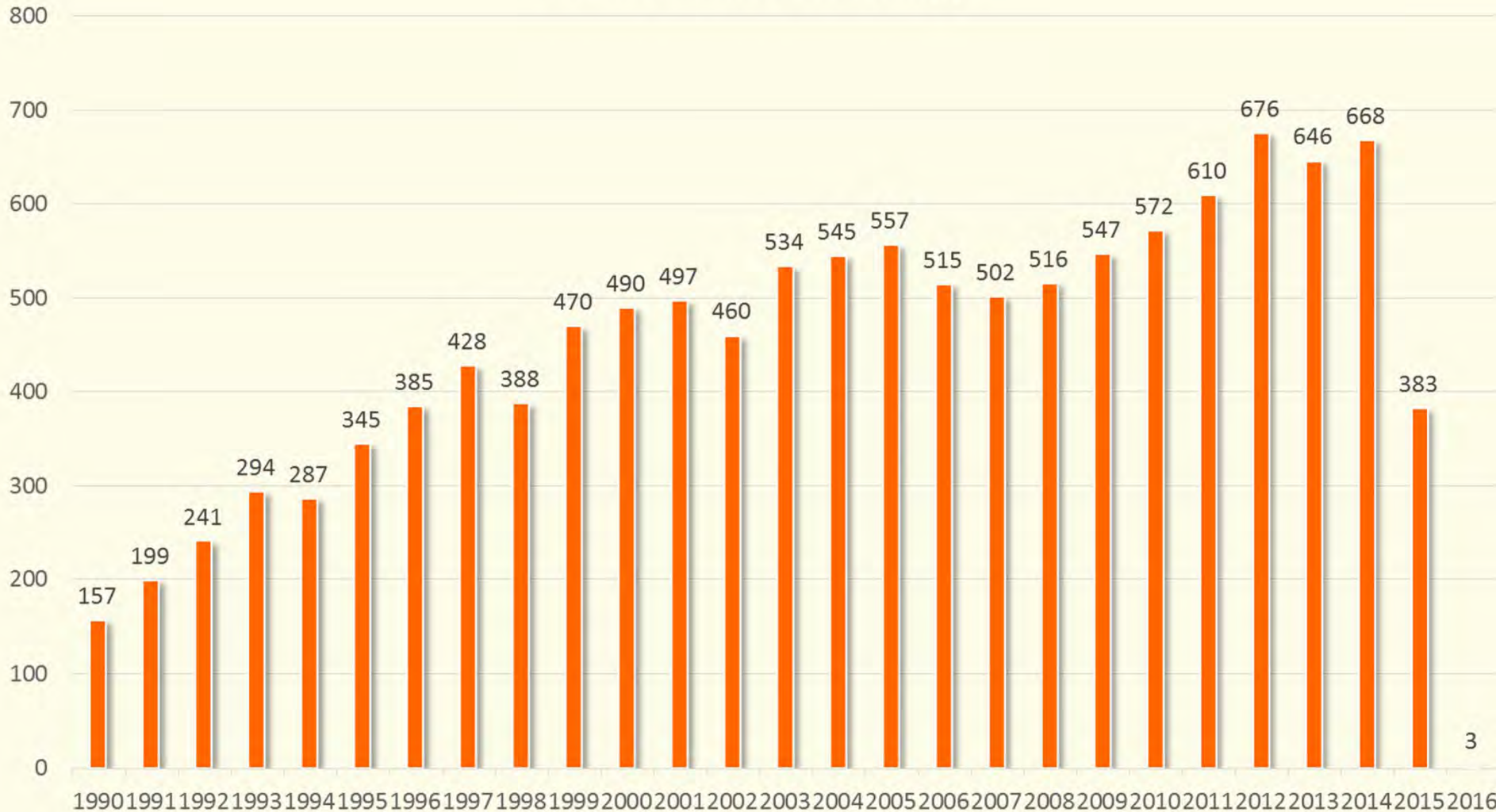
- Exciting, Promising area of investigation on Neuro Disease, Liver Health and Radiation Protection
- Lack of large scale, FDA approved human trials to get the claim for any of the therapeutic areas
- CNS market size: US\$56 bil.
- Liver Disease market size: US\$25 bil.

PALM CAROTENE COMPLEX

Another major component in the minor constituents of crude palm oil - (500ppm)

Number of Research Studies 1990 - 2015: β -Carotene

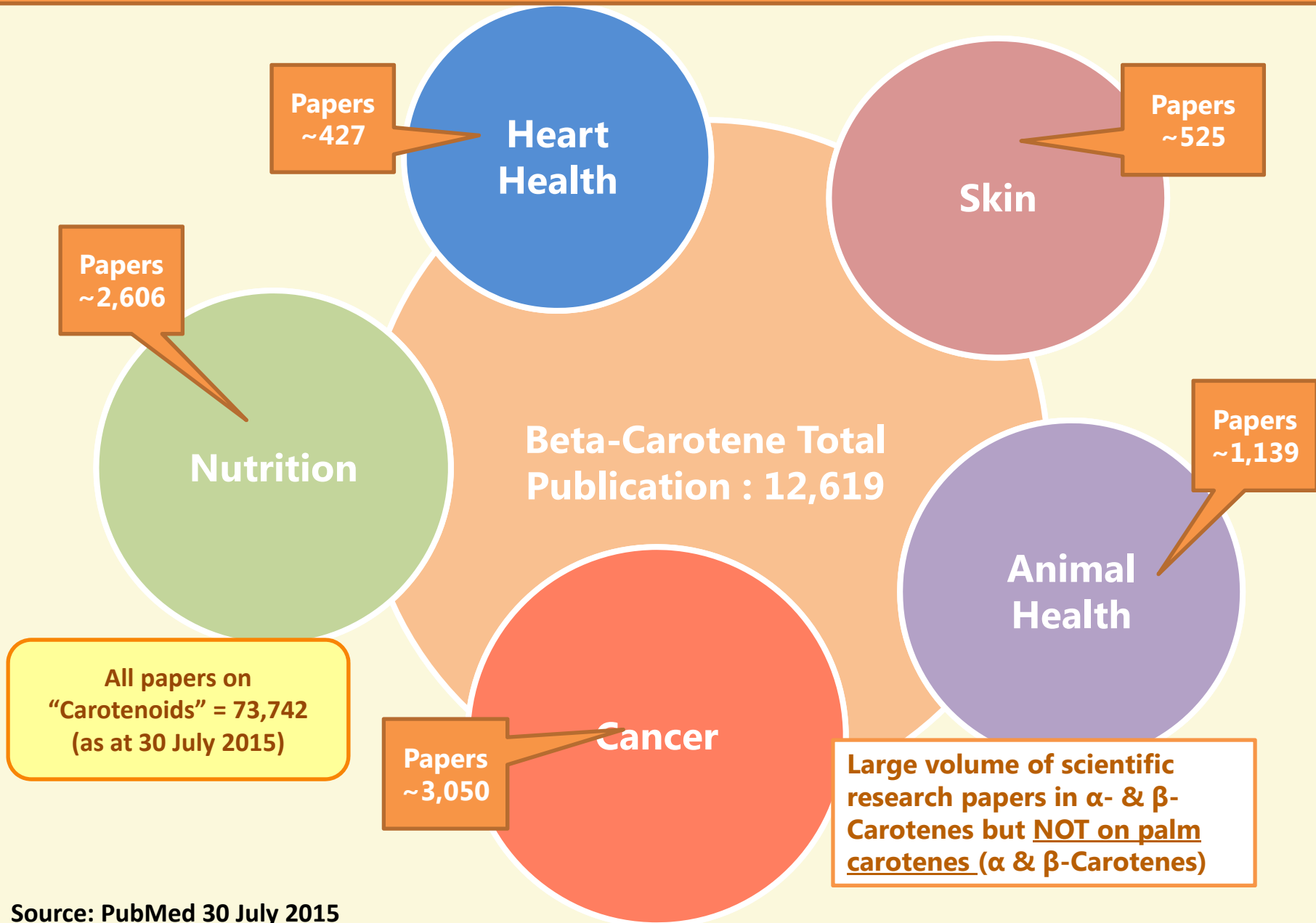
Number of Publications(*)



(*) Filters applied (see next slide for details)

Source - Pubmed 30 July 2015

Key Research Areas for β -Carotene



Why the Neglect?

Challenges and Hurdles ahead for Tocotrienol research (1)

- Research spread over many therapeutic areas
- Evidence to date supports commercial applications in cosmetic and supplement market but not pharmaceutical
- Lack of systematic approach to target pharmaceutical claim
- To comply with pharmaceutical claim data collected must meet GLP, GCP and other FDA requirements
- Lack of palm carotenoid research, an orphan?

Challenges and Hurdles ahead for Tocotrienol research (2)

- Is there an opportunity to develop high tocotrienol and carotenoid palm variety or clones?
- Methyl ester a byproduct of most commercial processes may be a limiting factor for higher production of tocotrienols
- Palm sustainability image is an issue
- Low consumer awareness of health benefits of palm tocotrienols and carotenoids
- Awareness of vit E and tocotrienols amongst researchers and regulators

THANK YOU

I can be reached at
dho@hovid.com