

# レチノイド研究の潮流と展望

Perspectives on retinoid research

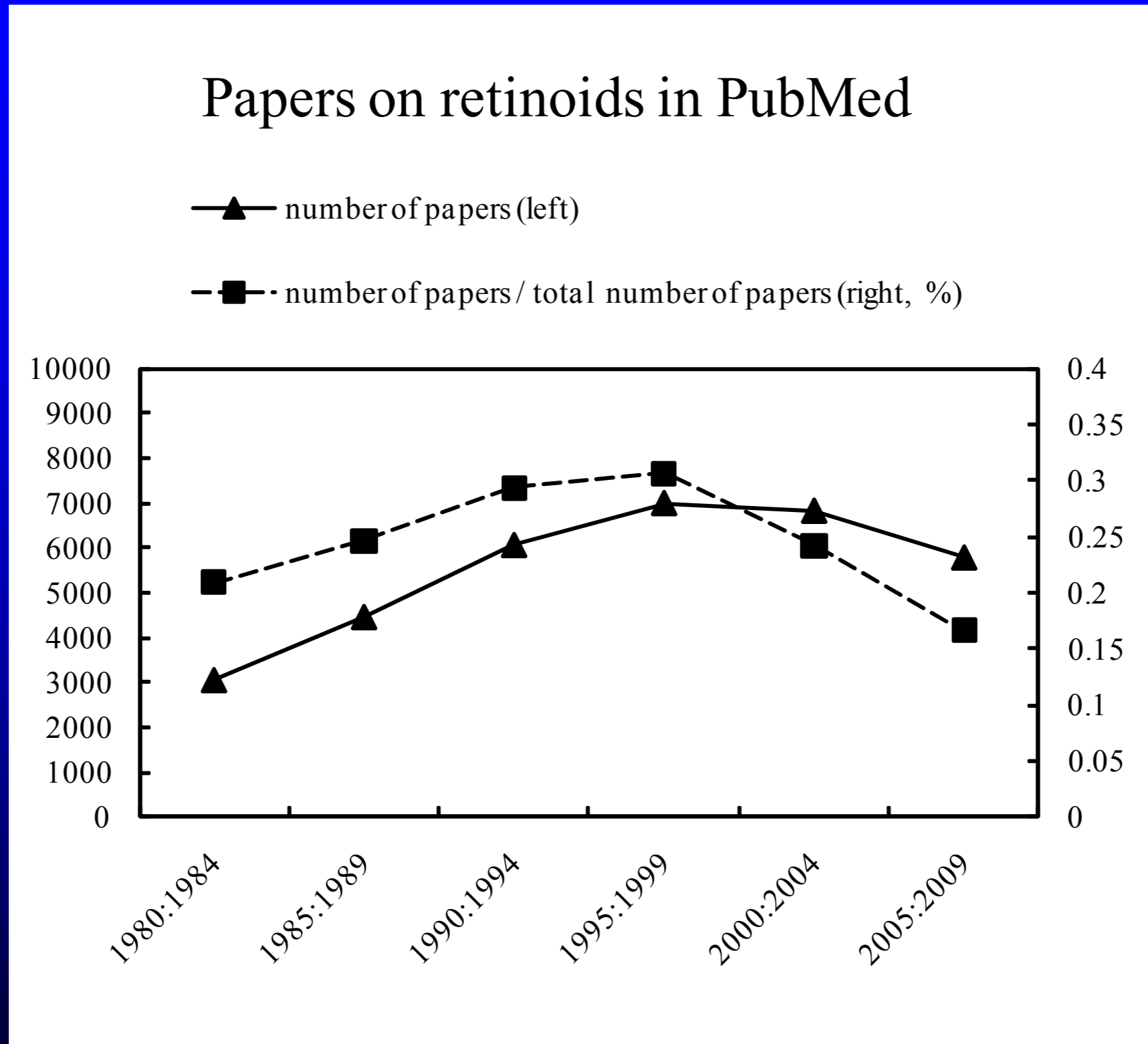
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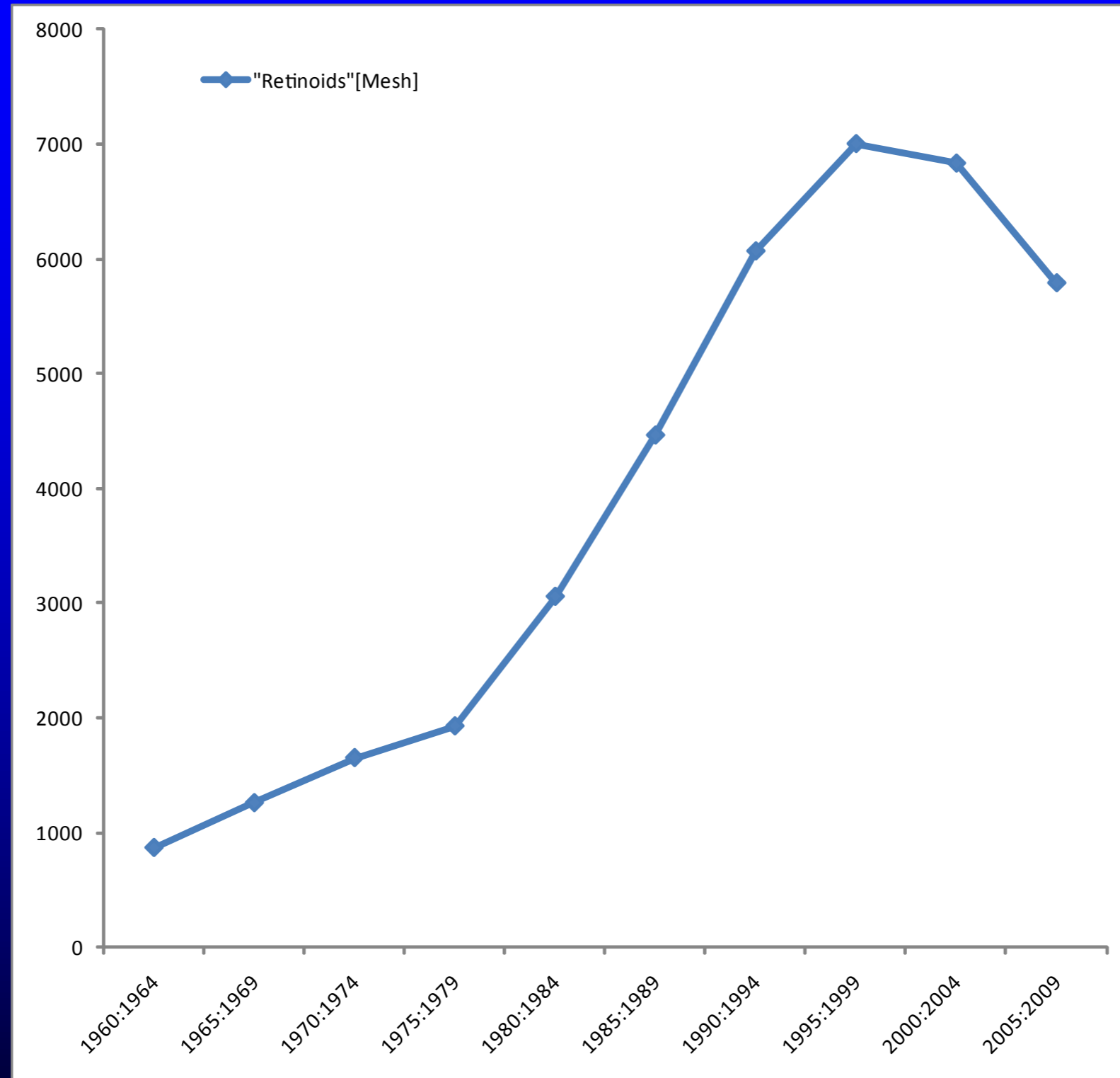
Department of Cell Biology and Morphology, Akita University Graduate School of Medicine.

# Declining number of papers on retinoids in the 21st century



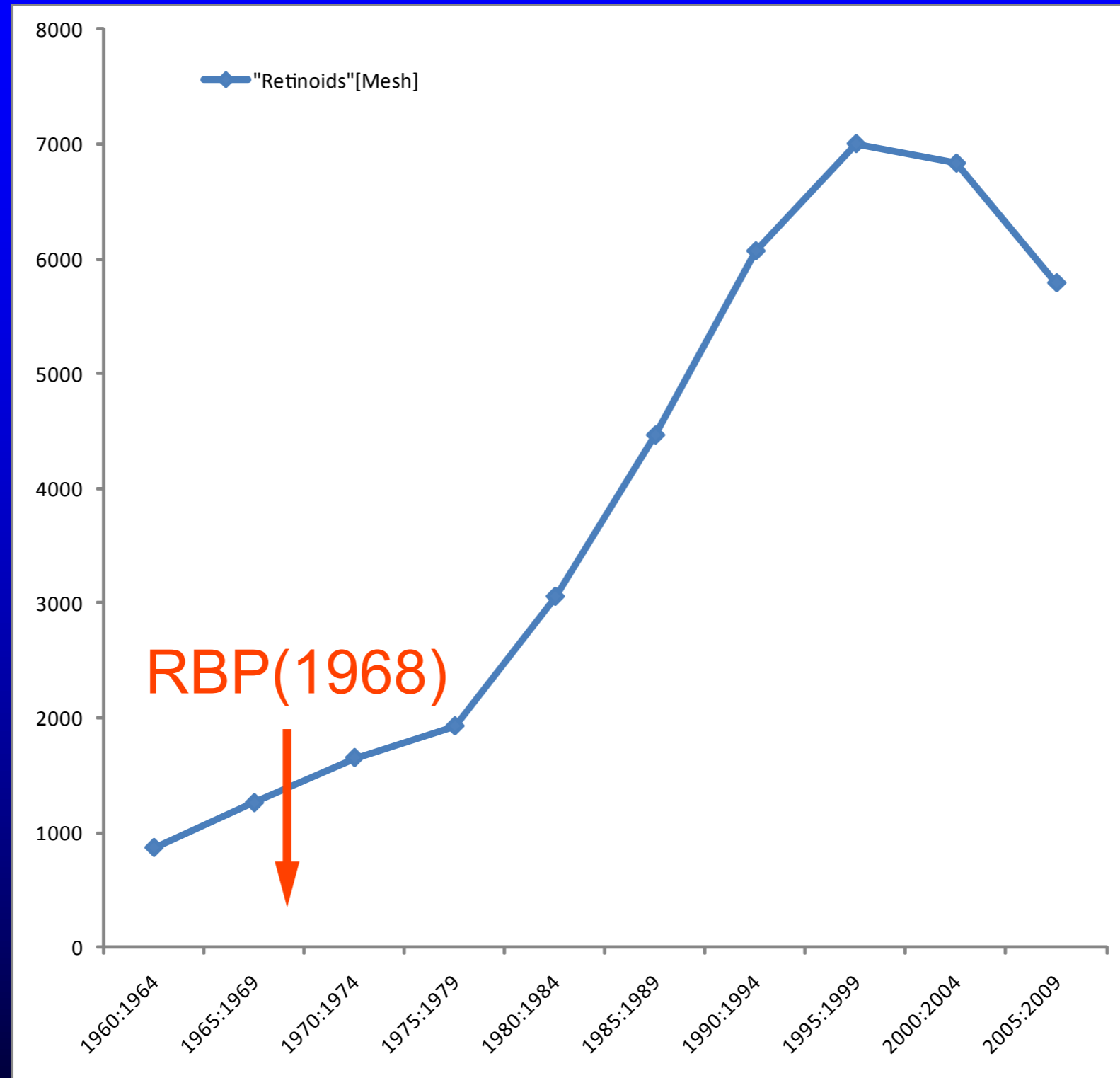
Number of papers on retinoids is declining in the 21st century.

# Hallmark discoveries on retinoid research



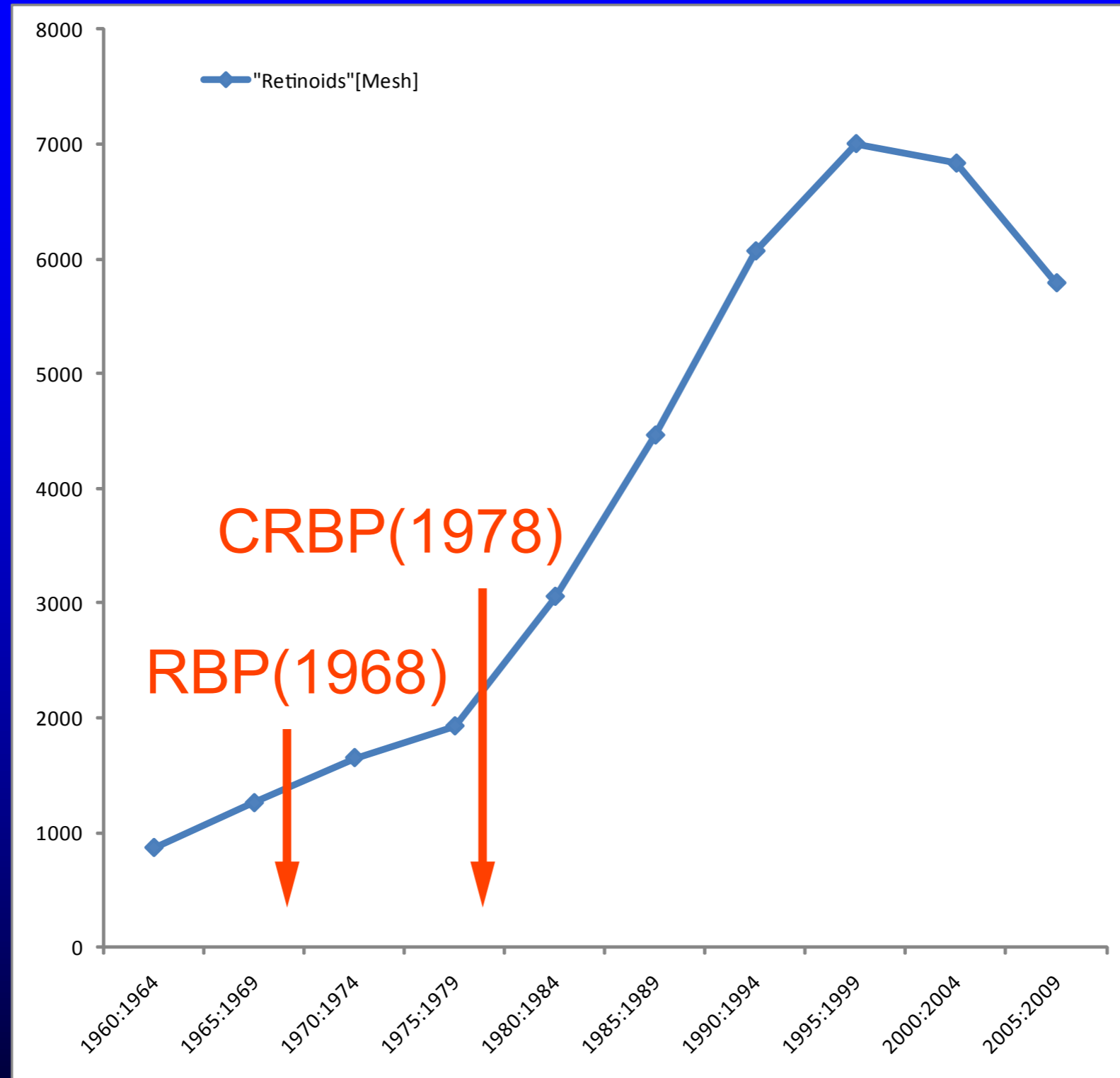
Papers on retinoids from 1960 to present (2009).

# Hallmark discoveries on retinoid research



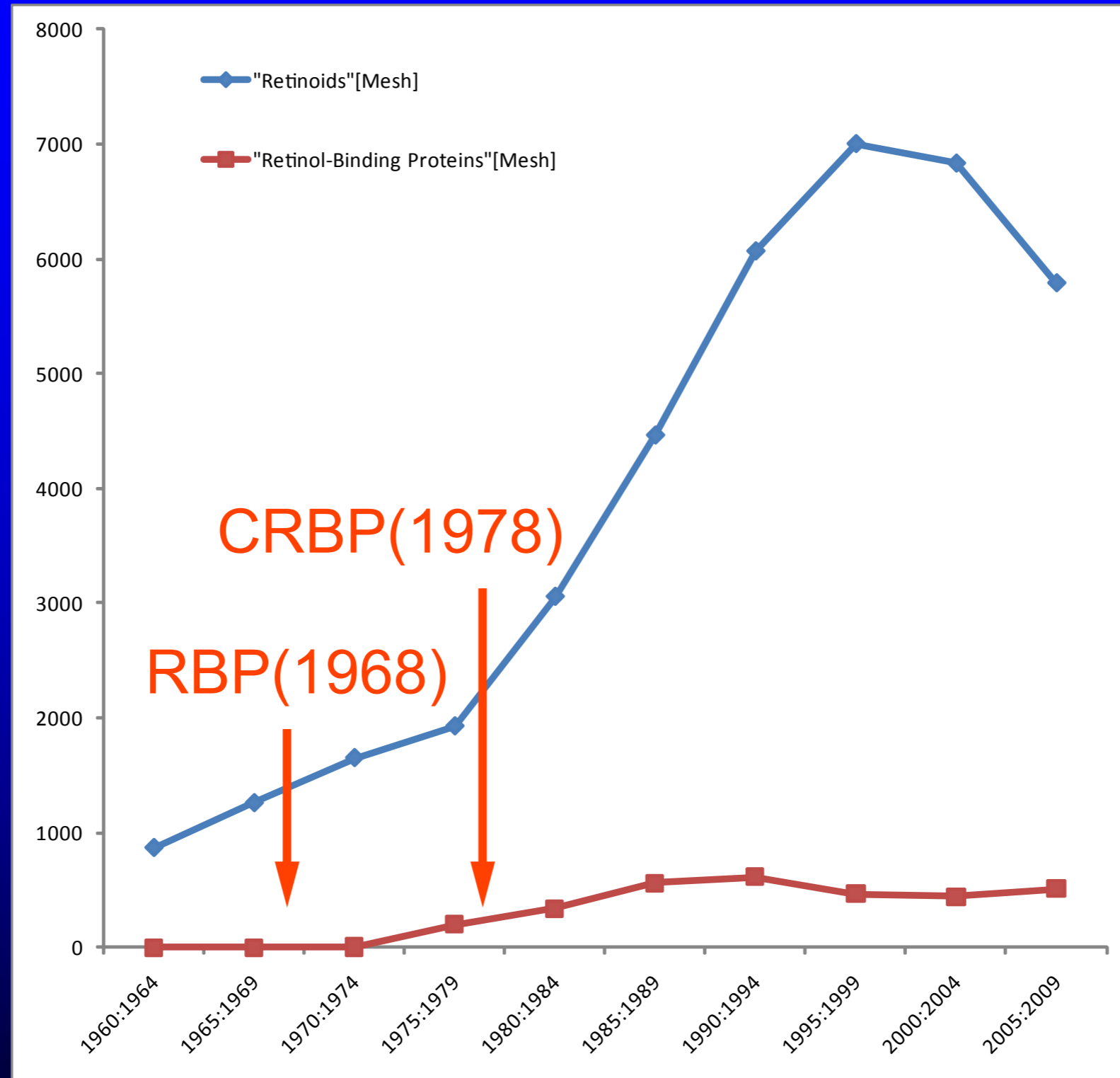
Retinol-binding protein (RBP, also called RBP4) was purified on 1968  
(Kanai *et al.* J. Clin. Invest. 1968, 47:2025-2044).

# Hallmark discoveries on retinoid research



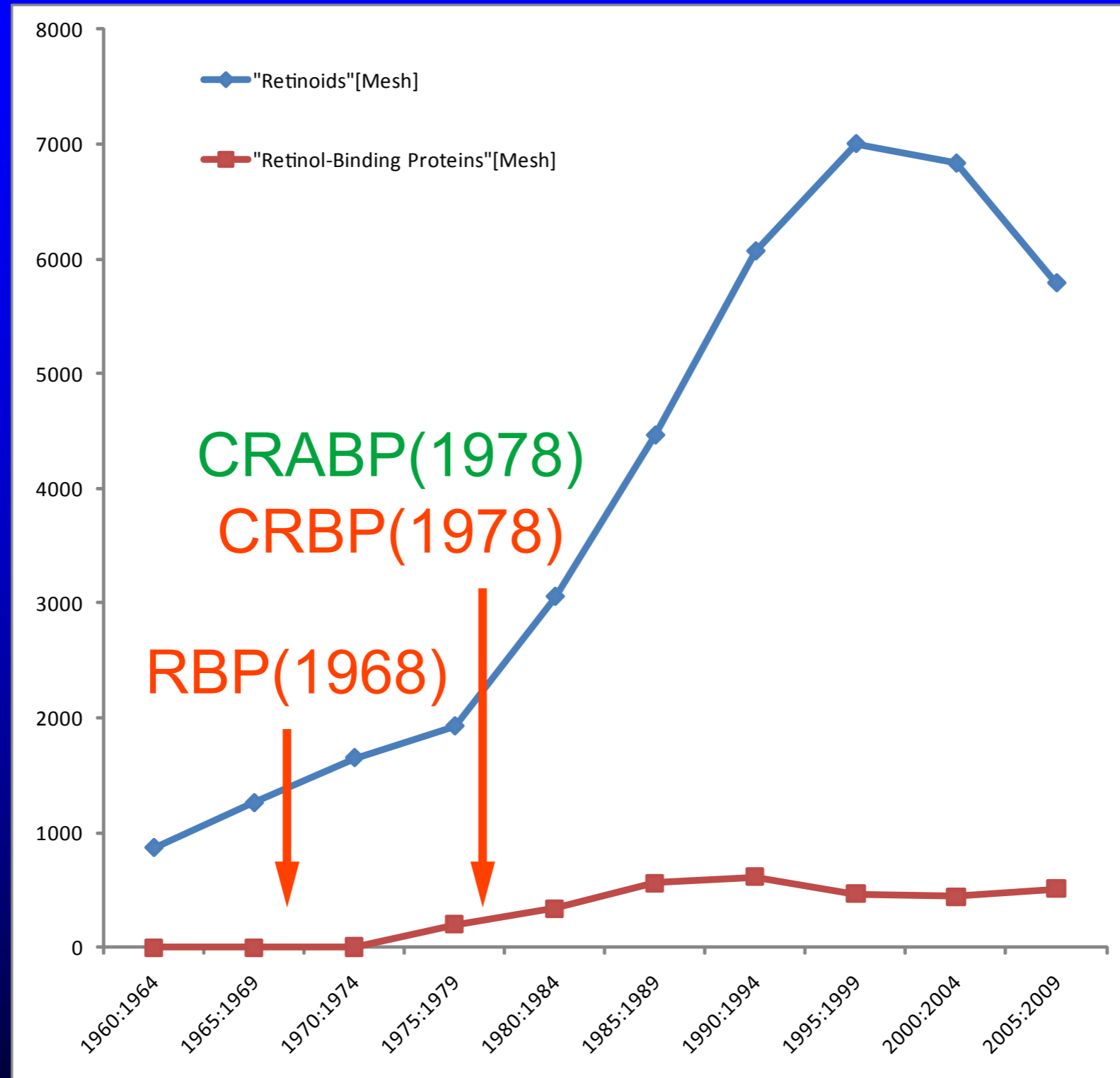
Cellular retinol-binding protein (CRBP, also called RBP1) was purified on 1978  
(Ong and Chytil J. Biol. Chem. 1978, 253:828-832).

# Hallmark discoveries on retinoid research



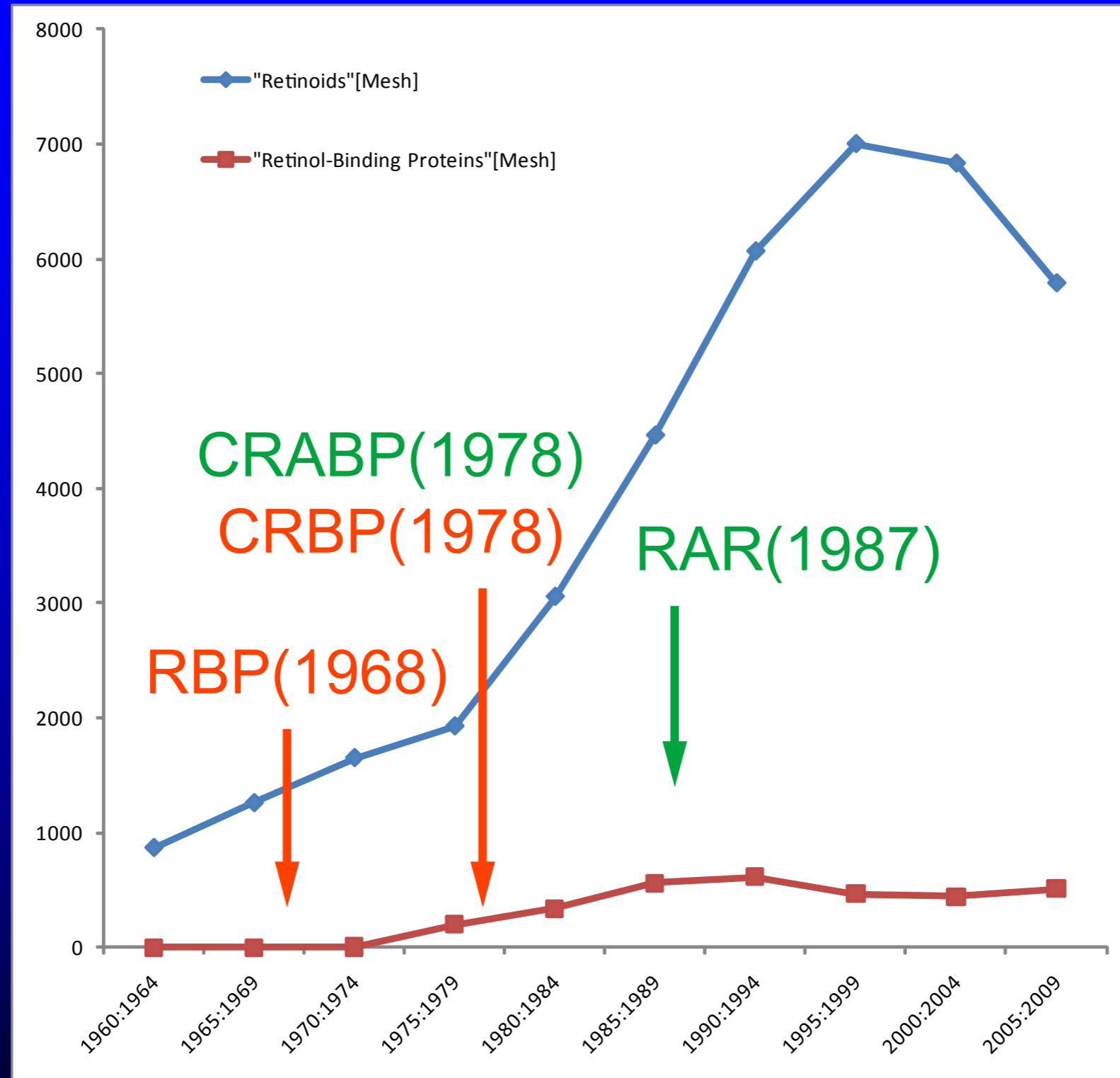
Number of papers concerning RBP and CRBP is increased after the discovery of these proteins.

# Hallmark discoveries on retinoid research



Cellular retinoic acid-binding protein (CRABP) was purified on 1978  
(Ong and Chytil J. Biol. Chem. 1978, 253:4551-4554).

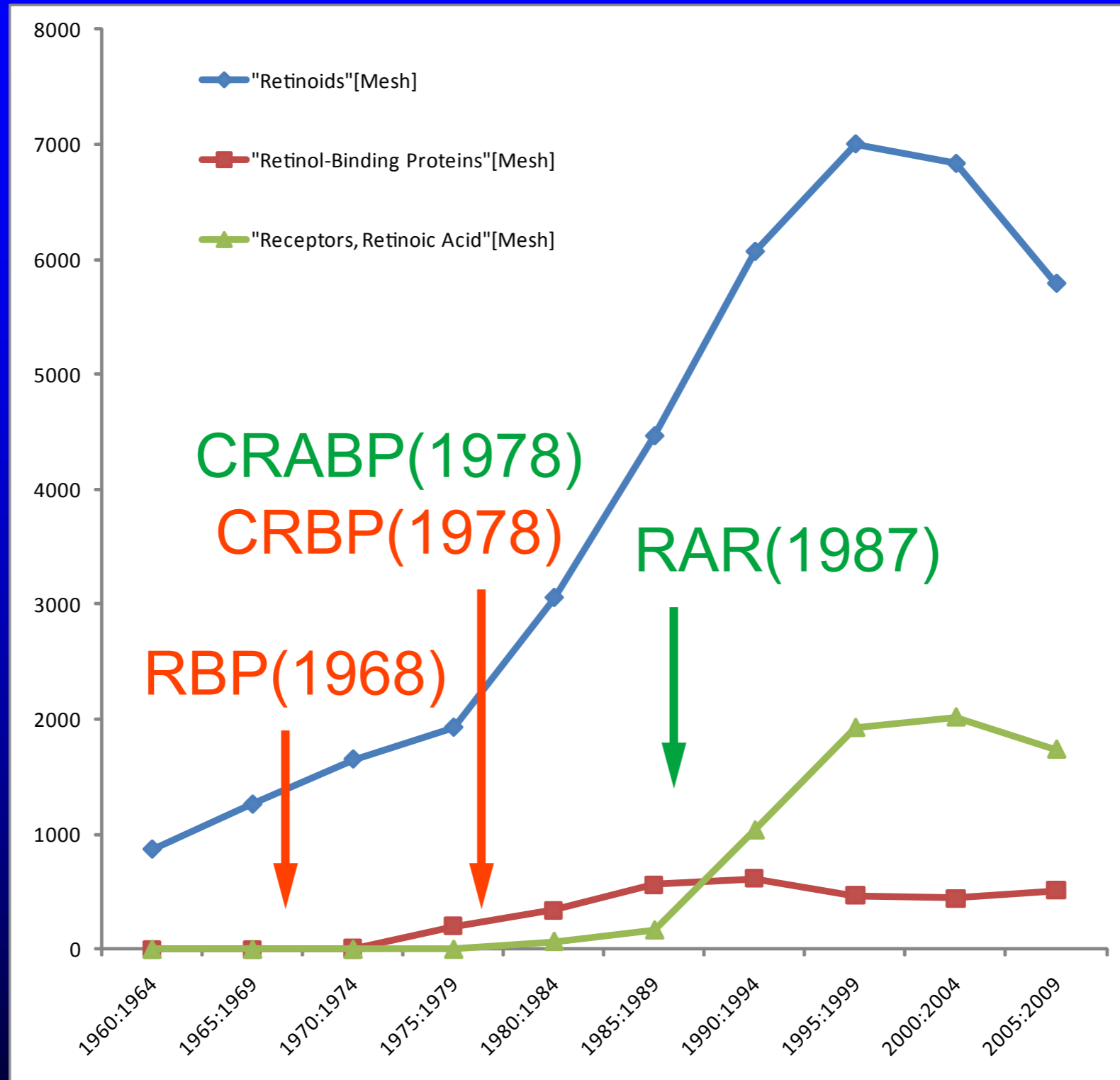
# Hallmark discoveries on retinoid research



Retinoic acid receptor (RAR) was cloned on 1987  
(Petkovich *et al.* Nature 1987, 330:444-450).

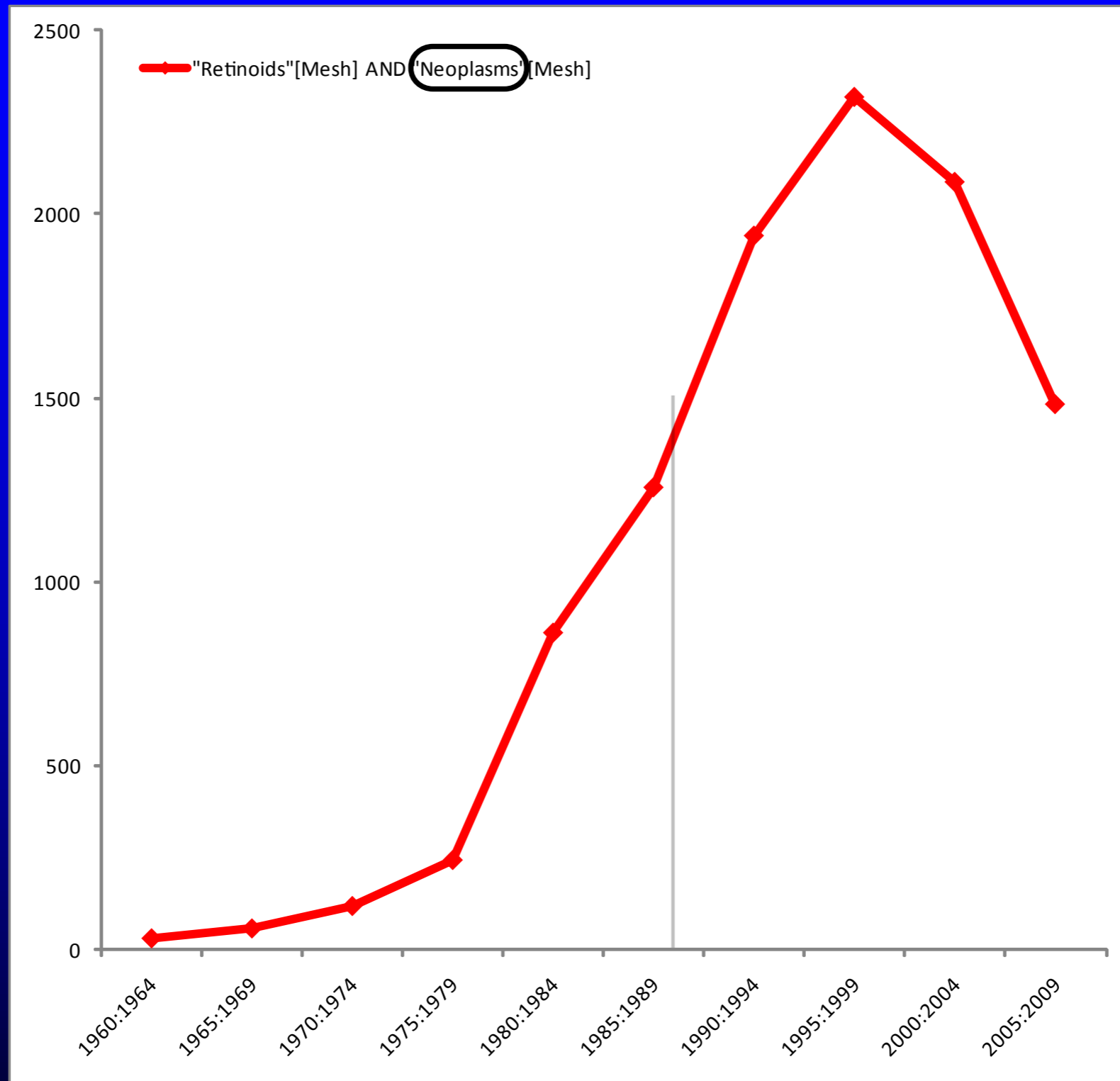


# Hallmark discoveries on retinoid research



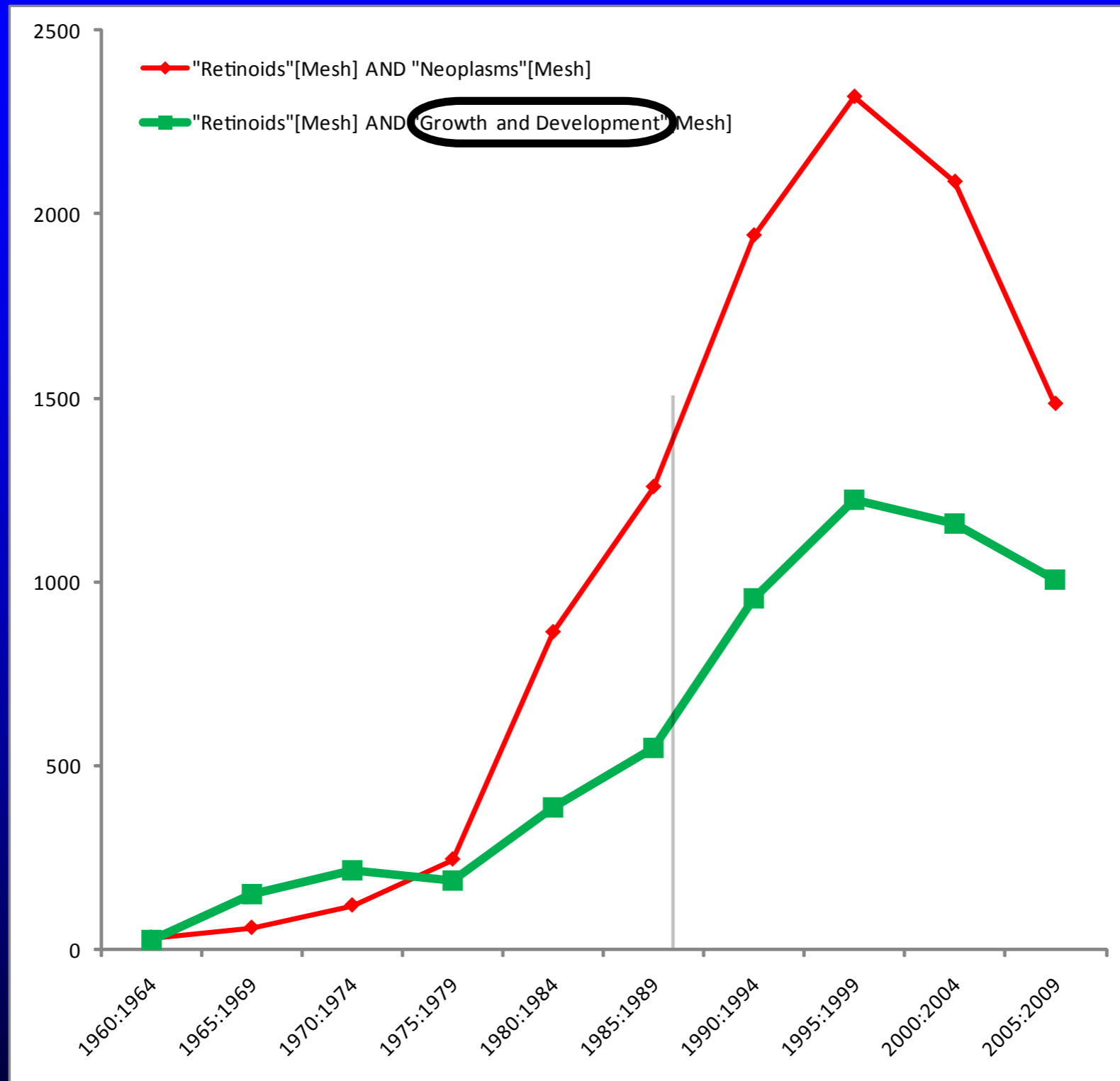
Number of papers concerning CRABP and RAR is increased rapidly after the discovery of these proteins.

# Fields on retinoid research



Number of papers concerning both retinoids and neoplasm is shown here.  
A vertical line in the column 1985:1989 indicates the year of cloning of RAR.

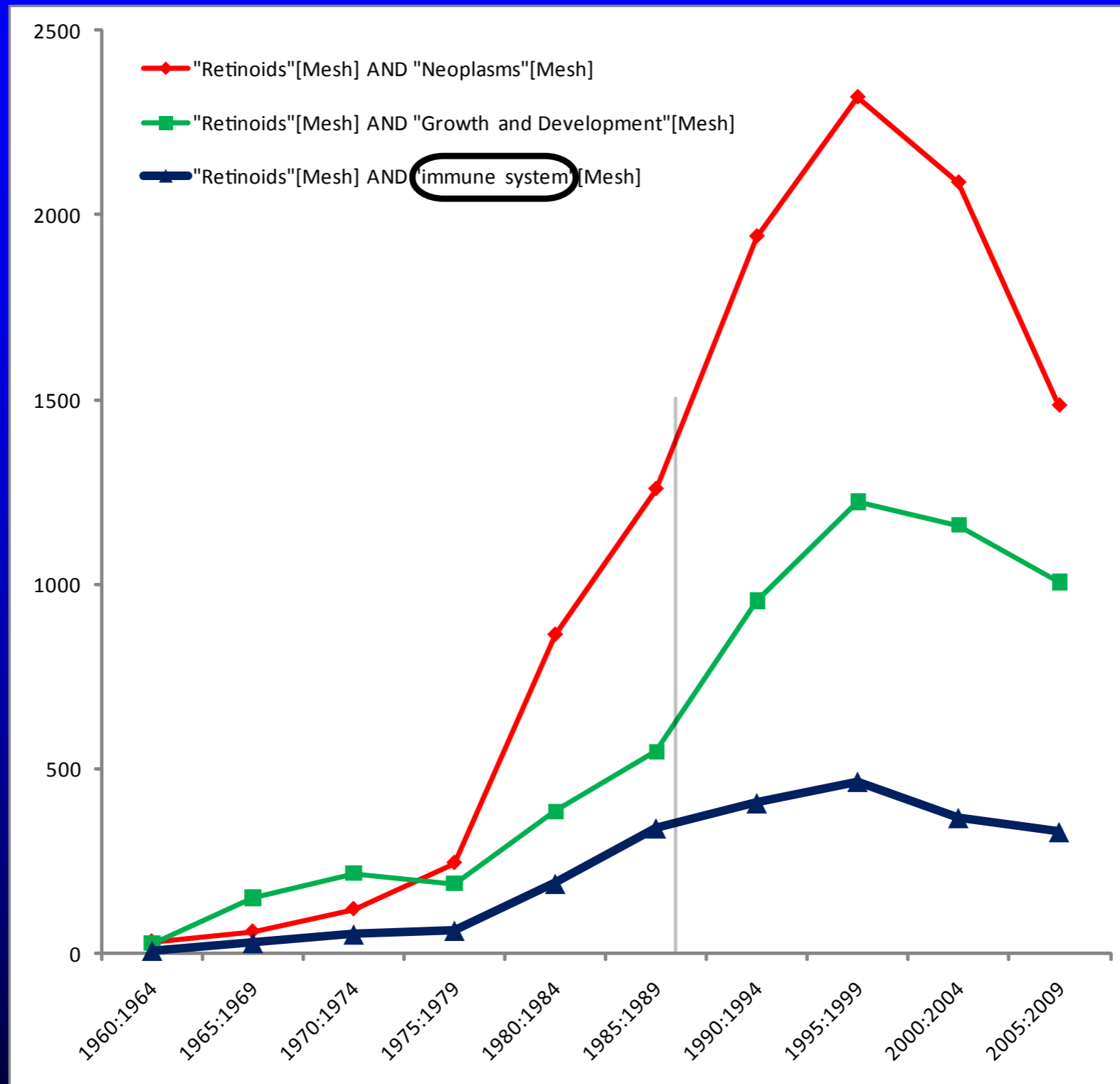
# Fields on retinoid research



Number of papers concerning both retinoids and “growth and development” is shown here.

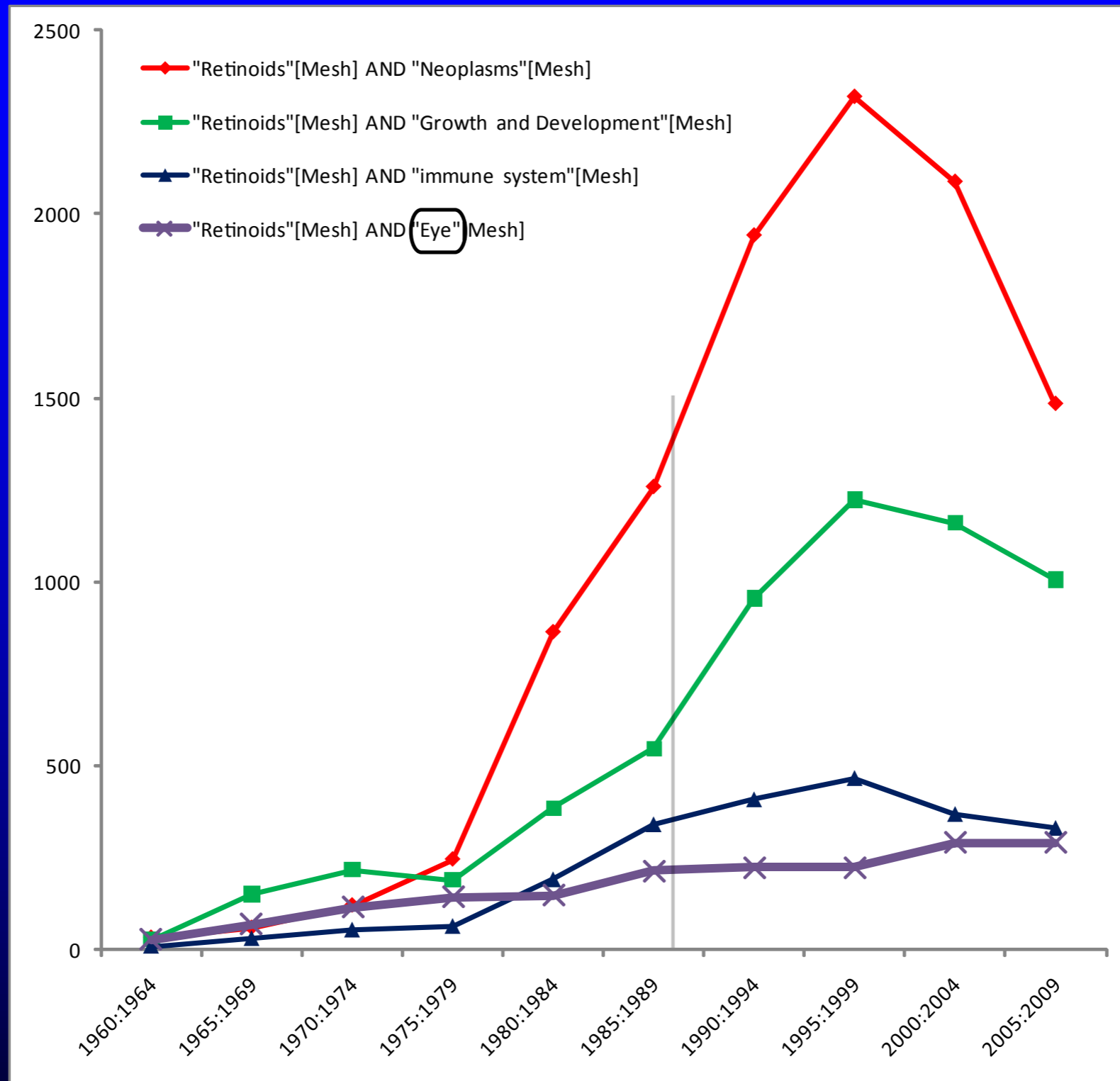
There are two peaks around 1970s and 1990s.

# Fields on retinoid research



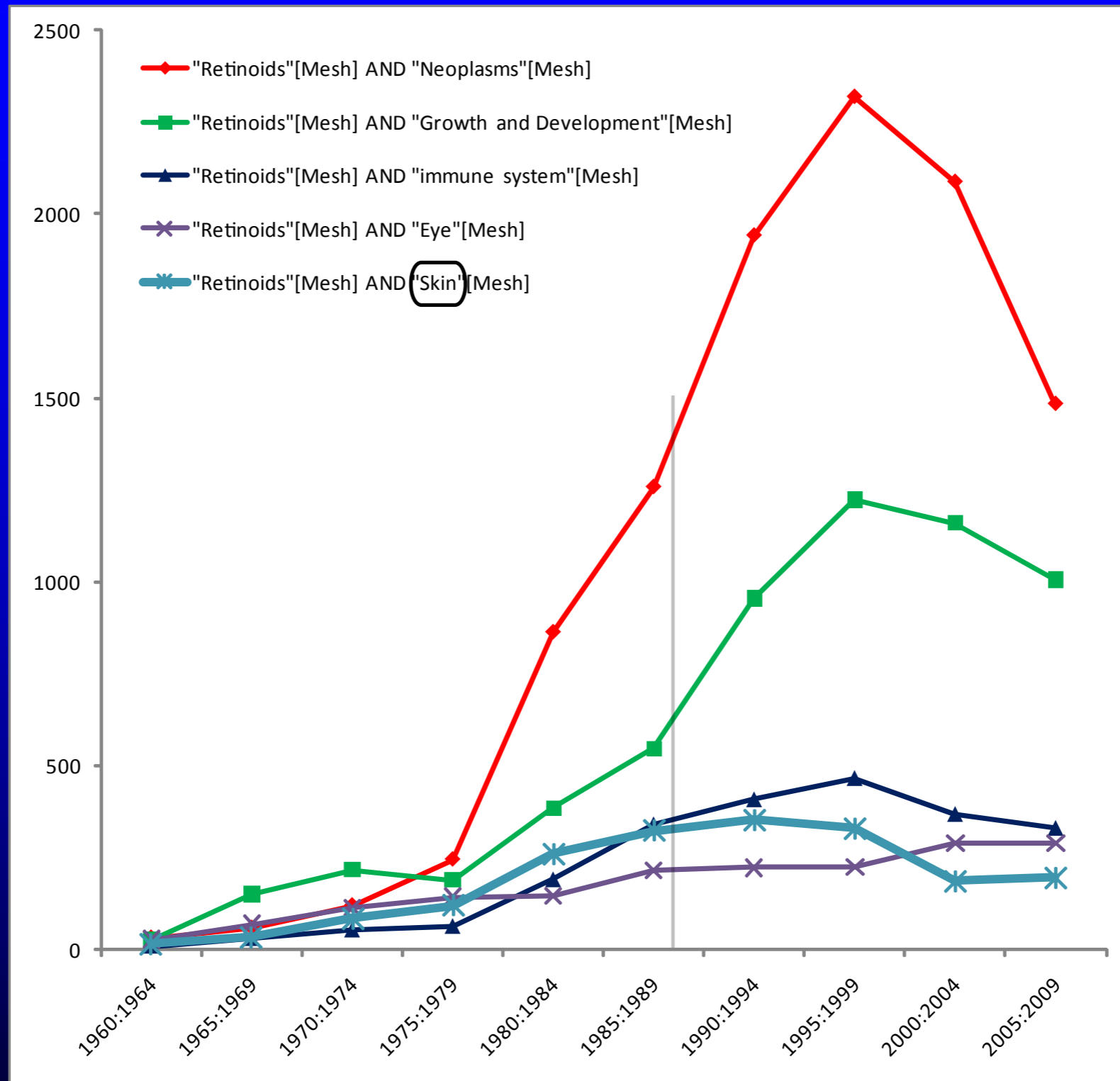
Number of papers concerning both retinoids and immune system is shown here.

# Fields on retinoid research



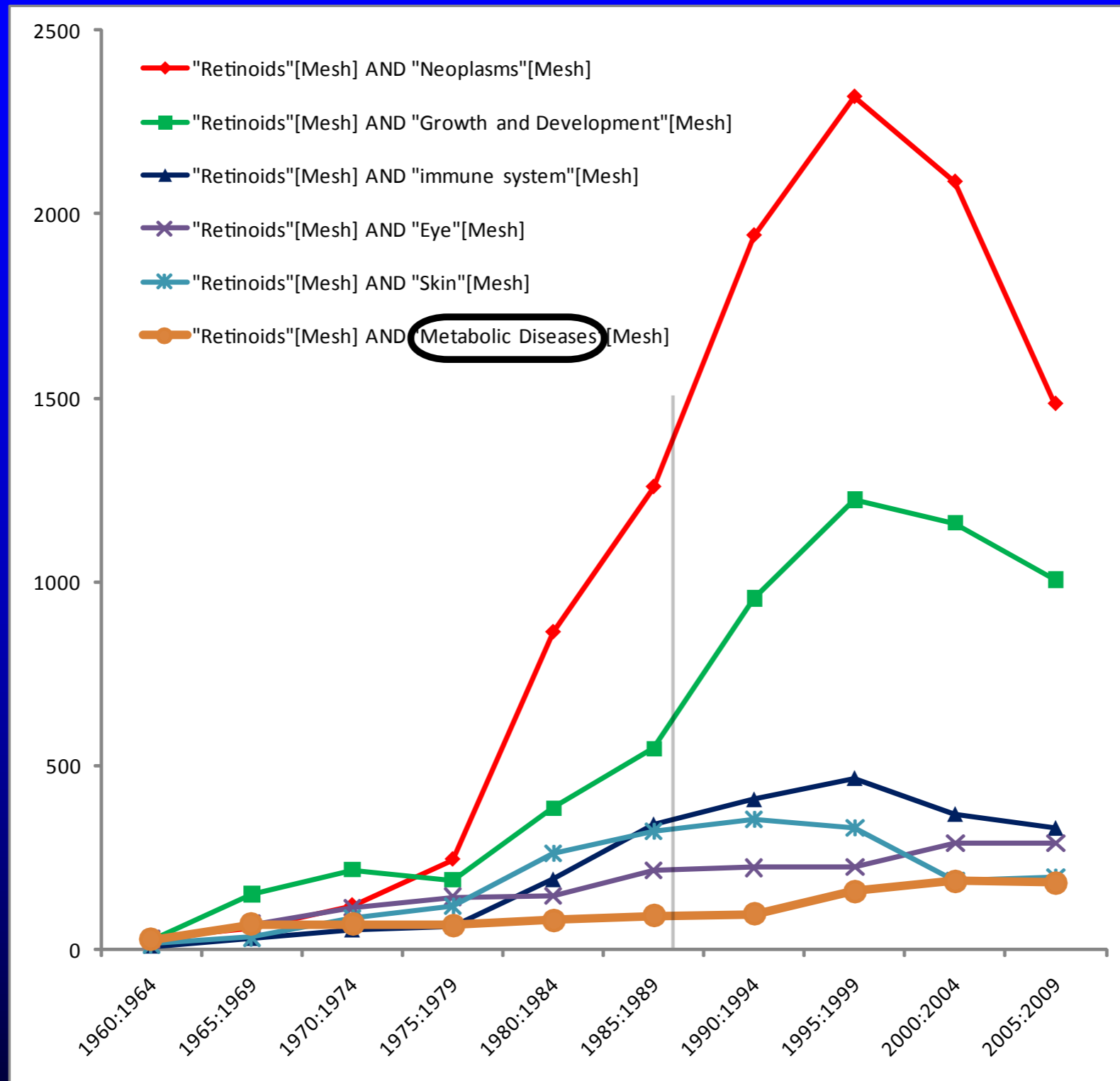
Number of papers concerning both retinoids and eye is not affected by the cloning of RAR, because retinal, not retinoic acid, is involved in the vision as a component of rhodopsin.

# Fields on retinoid research



Number of papers concerning both retinoids and skin is shown here.

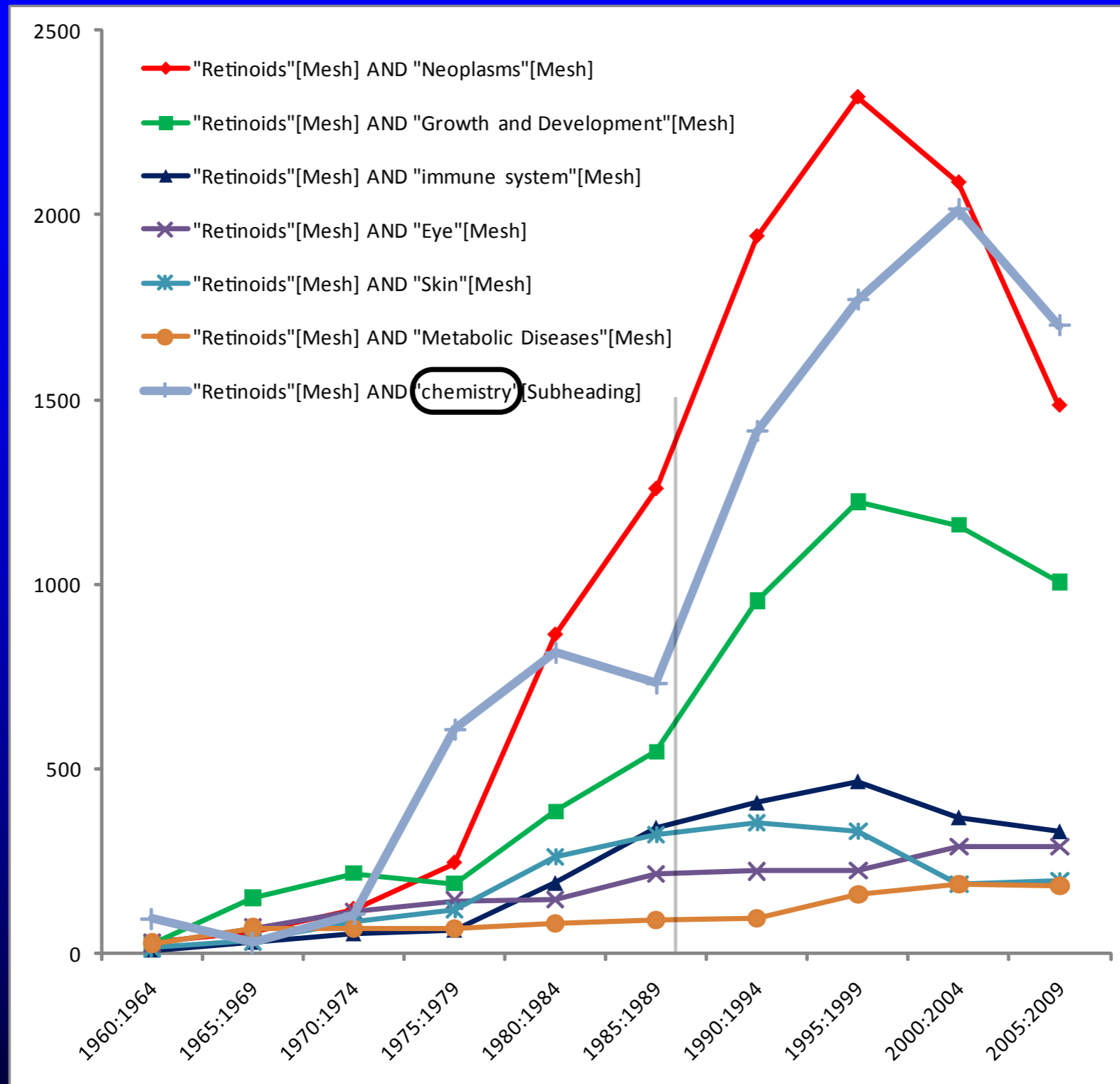
# Fields on retinoid research



Number of papers concerning both retinoids and “metabolic diseases” is shown here.

The relationship between RBP and insulin resistance is reported recently.

# Fields on retinoid research



Number of papers concerning both retinoids and chemistry is increased from the very beginning of the retinoid research.



# Summary

Retinoid research has evolved by several breakthrough discoveries which occurred every ten years.

A new breakthrough discovery may be needed to further develop the field of retinoid research.

Variety of specialty and interest in the field of retinoid research will help develop the field.