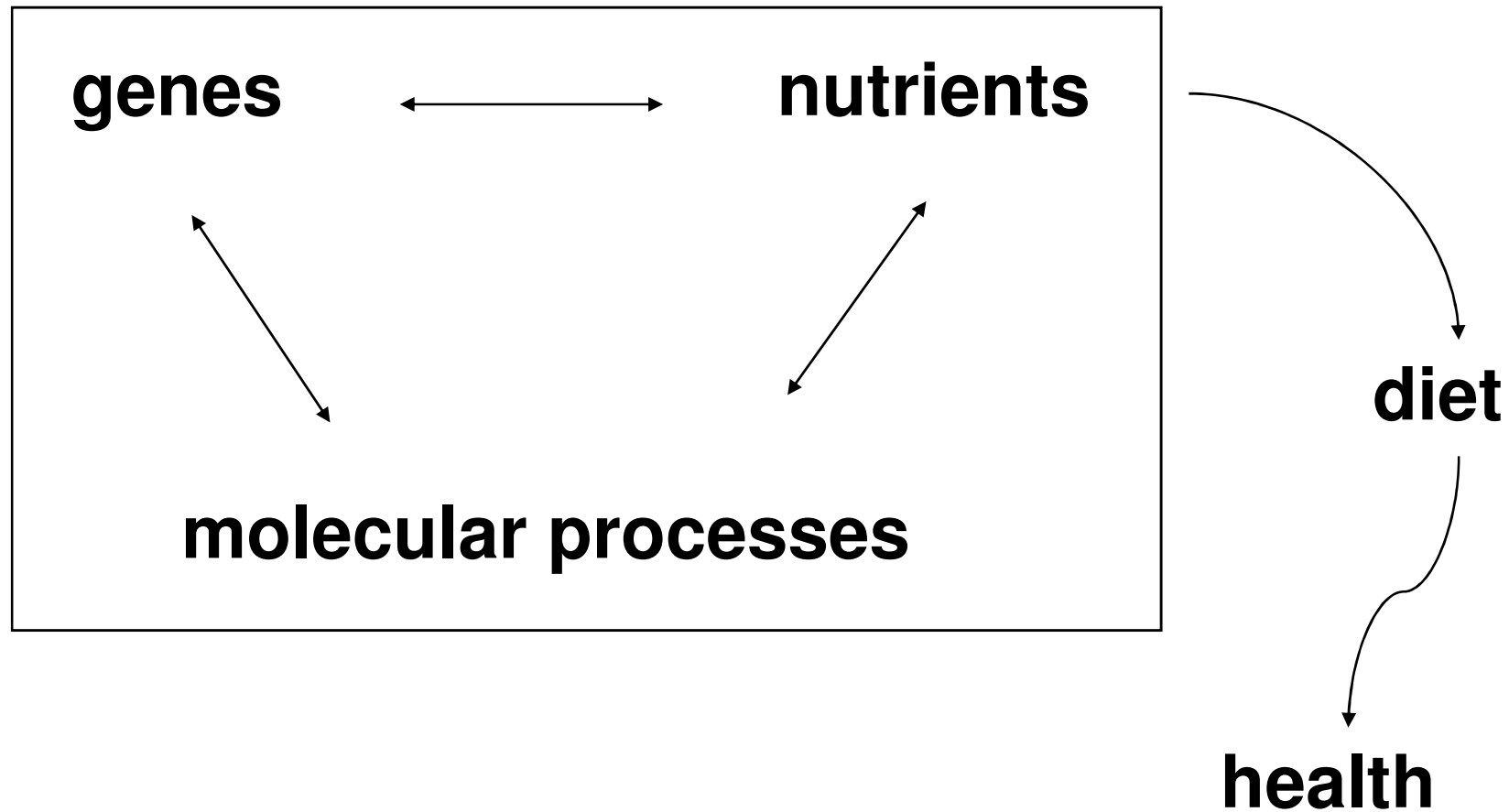

Nutritional Genomics



Dietary Factors

- direct and indirect influence
 - transcriptional, translational and posttranslational control
-

Intestinal Lumen – mucosal immune system

nutritional environment

hormone - dependent

**hormone –
independent:
> nutrients**

gene regulation

Nutrigenetic and nutrigenomic effects

- nutrigenetic effect:
 - influence of polymorphisms on altering the response to dietary components
 - nutrigenomic effect:
 - ability of different food components to increase or depress gene expression
-

FABPs – fatty acid binding proteins

- lipid balance
 - control of metabolic and inflammatory pathways
 - modulation of FABP activity
 - > regulation of lipid-sensitive pathways??
-

Cancer prevention

- ω -3 Poly Unsaturated Fatty Acids (PUFAs)
 - > influence on expression of genes
 - > anti-cancer activity
 - > downregulation of synthesis and expression
 - > induction of pro-apoptotic proteins
-

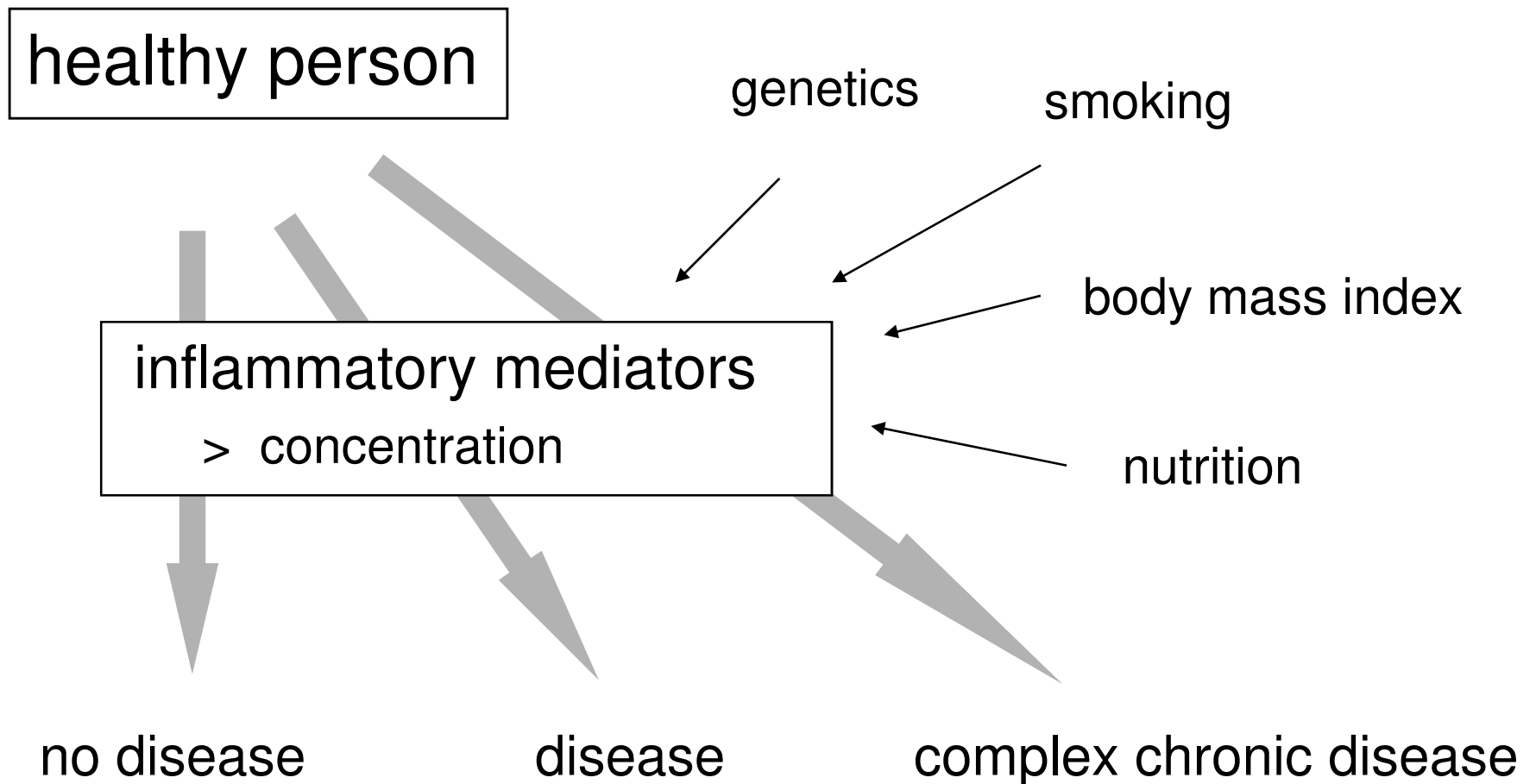
Leptin

- communicates information of the bodies fat stores
 - altered levels of leptin > eating disorders (anorexia nervosa)
 - regulates different genes (SCD1)
> leptin resistance in obese individuals
-

**Interleukin 1 genetics,
inflammatory mechanisms,
and nutrigenetic opportunities
to modulate diseases of aging**

Kenneth S. Kornman

Inflammation



Interleukin 1

- IL-1 and TNF- α > early activated
 - drugs that block their activity
 - > treatment of rheumatoid arthritis
-

Interleukin 1 gene variations

Interleukin 1 (IL-1) single-nucleotide polymorphisms

	IL-1A	IL-1B		IL-1RN
IL-1 cluster haplotype	(+4845) or (-889)	(+3954)	(-511) or (-31)	(+2018) or VNTR
1	2	2	1	1
2	1	1	2	1
2b	1	1	2	2
3	1	1	1	1

Increased risks

- haplotype 1 > periodontitis
 - haplotype 1 > cardiovascular disease
 - haplotype 2 > gastric cancer
-

Nutrients interact with inflammatory genes

- poly unsaturated fatty acids (PUFAs)
 - > inhibition of secretion of IL-1 and TNF- α
 - nutrients that alter the oxidation-reduction status of the cell
 - different effects in individuals with different polymorphisms
-

Conclusion

- better understanding of polymorphisms
 - > identify at-risk persons
 - > interventions
 - screening for bioactive nutrients
 - problems:
 - > costs (testing of asymptomatic people)
 - > primary preventive measures
-