

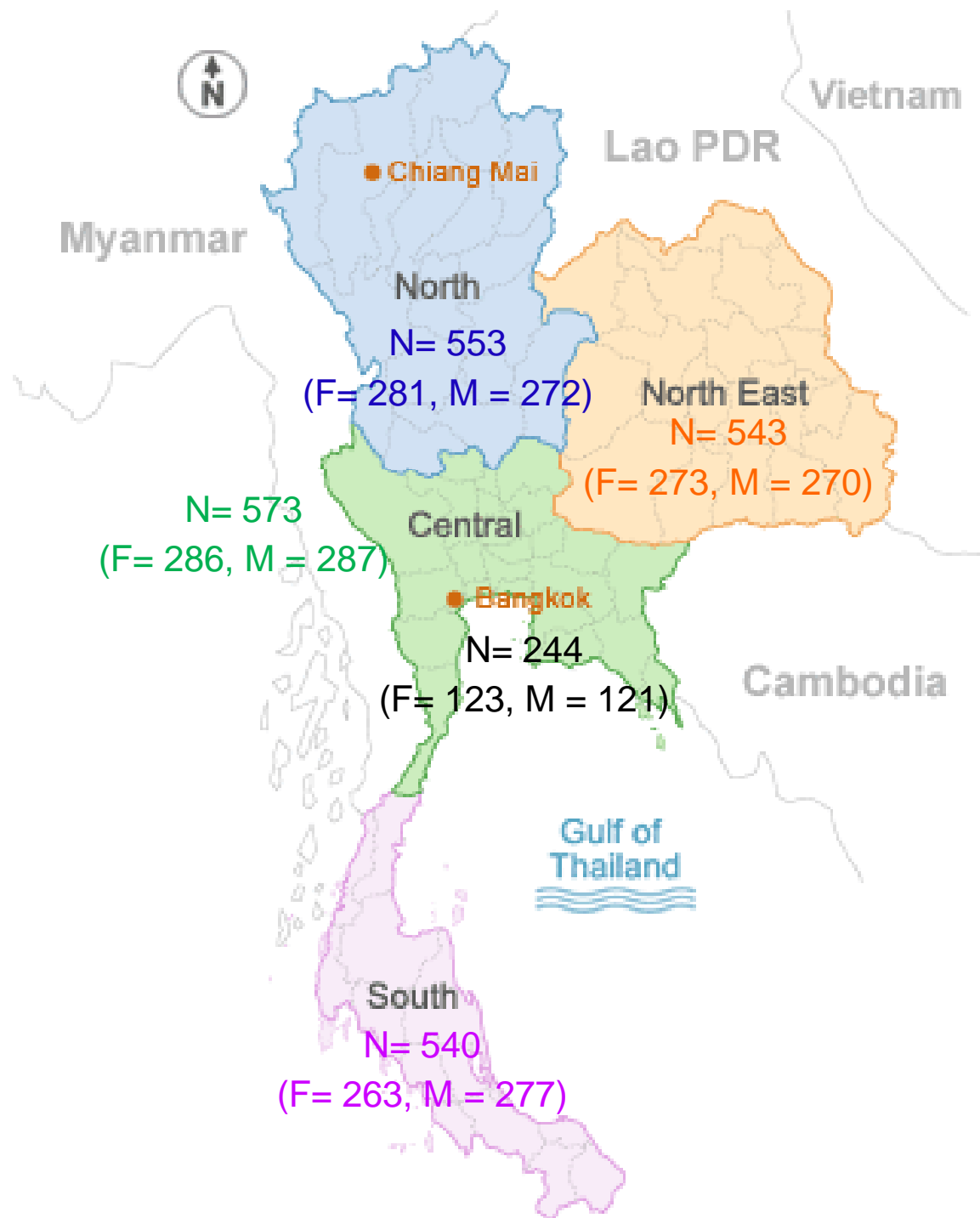
Causal Effects of Vitamin D and Fetuin-A on Metabolic Phenotypes

Boonsong Ongphiphadhanakul, M.D.

Department of Medicine

Ramathibodi Hospital

Mahidol University



- 2,453 subjects randomly selected from the National Health Examination Survey for 25(OH)D measurement by LC/MS

Prevalence of Vitamin D Deficiency/Insufficiency in Thais

	< 20 ng/mL	< 25 ng/mL	< 30 ng/mL
Bangkok	14.3	38.9	63.1
Central	6.5	19.4	42.5
Northern	4.3	16.8	38.9
Northeastern	2.8	12.9	33.4
Southern	6.3	18.3	42.4

Adverse Outcomes Related to Inadequate Vitamin D Status

- Bone mass
- Fractures
- Walking speed
- TB
- URI
- Admission to ICU
- CVD
- Type 1 DM
- Type 2 DM
- Multiple sclerosis
- Preeclampsia
- Cancer

Vitamin D on Trial

NAME	PLACE	PARTICIPANTS	DOSE	MAIN OUTCOMES	CURRENT STATE	RESULTS EXPECTED
VITAL	U.S.	20,000, men: 50+ women: 55+	2000 IU D ₃ daily	Cancer, Cardiovascular disease	Recruitment to finish end of 2012	2017
FIND	Finland	18,000 men: 60+, women: 65+	1600 IU D ₃ daily or 3200 IU D ₃ daily	Cancer, Cardiovascular disease, Diabetes	Recruitment started in spring, supplementation to start in autumn	2020
ViDA	New Zealand	5100, 50+	100,000 IU D ₃ a month (200,000 IU in June)	Cardiovascular disease, Respiratory disease, Fractures	Recruitment to finish this year	2017
DOHealth	8 European cities	2150, 70+	2000 IU D ₃ daily	Infections, Fractures, Blood pressure, Cog- nitive function, Lower extremity function	Recruiting	2017
VIDAL	U.K.	20,000, 65–84	60,000 IU monthly	Longevity and others	Planned 2-year feasibility study on 1600 patients is recruiting	2020 (if main study gets go- ahead)

Association vs. Causation

A → B

B ← A

A ← B

Confounders

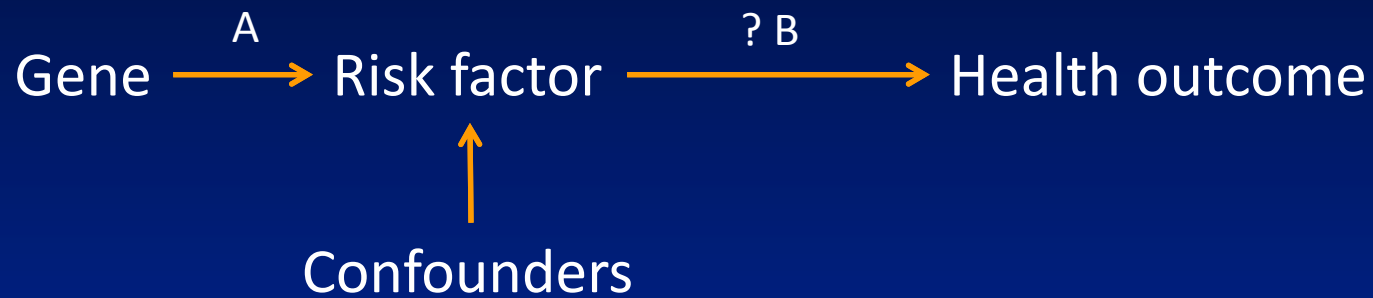
Mendelian Randomization Analysis

Gene \xrightarrow{A} Risk factor

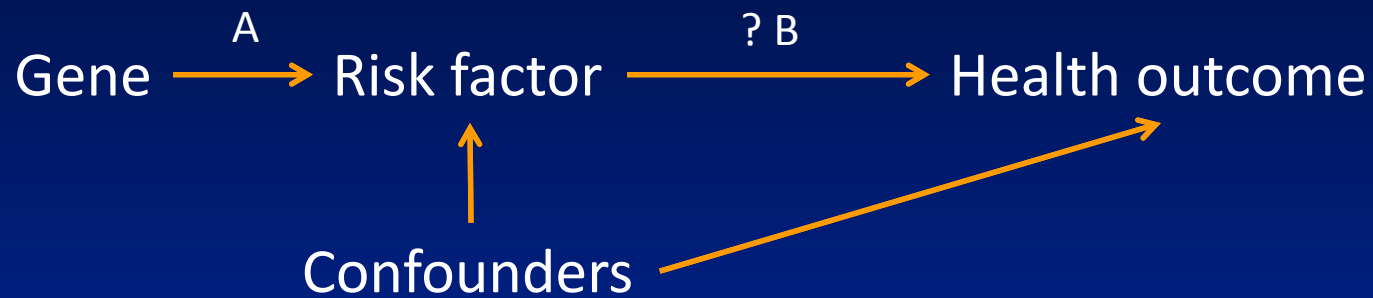
Mendelian Randomization Analysis



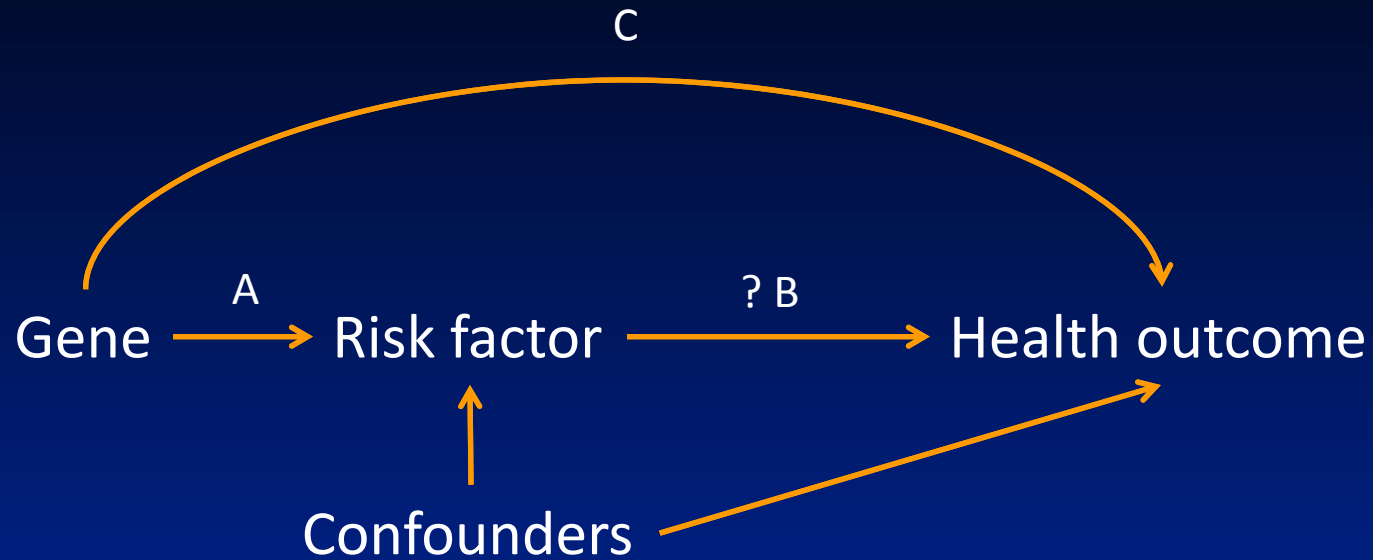
Mendelian Randomization Analysis



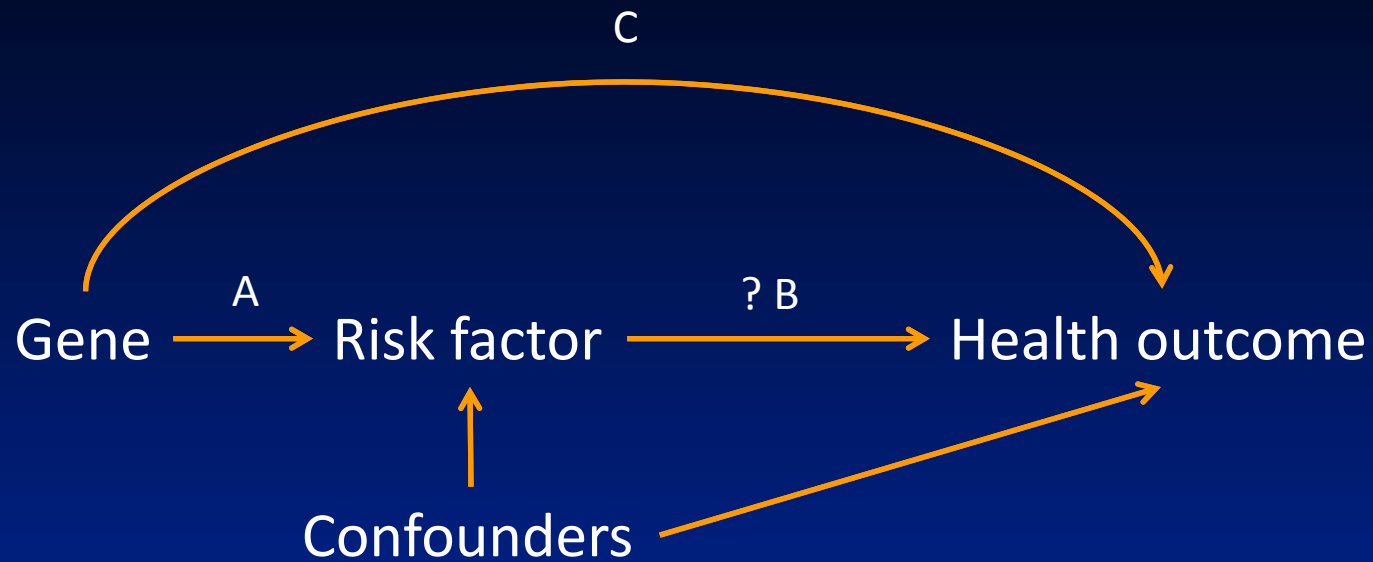
Mendelian Randomization Analysis



Mendelian Randomization Analysis



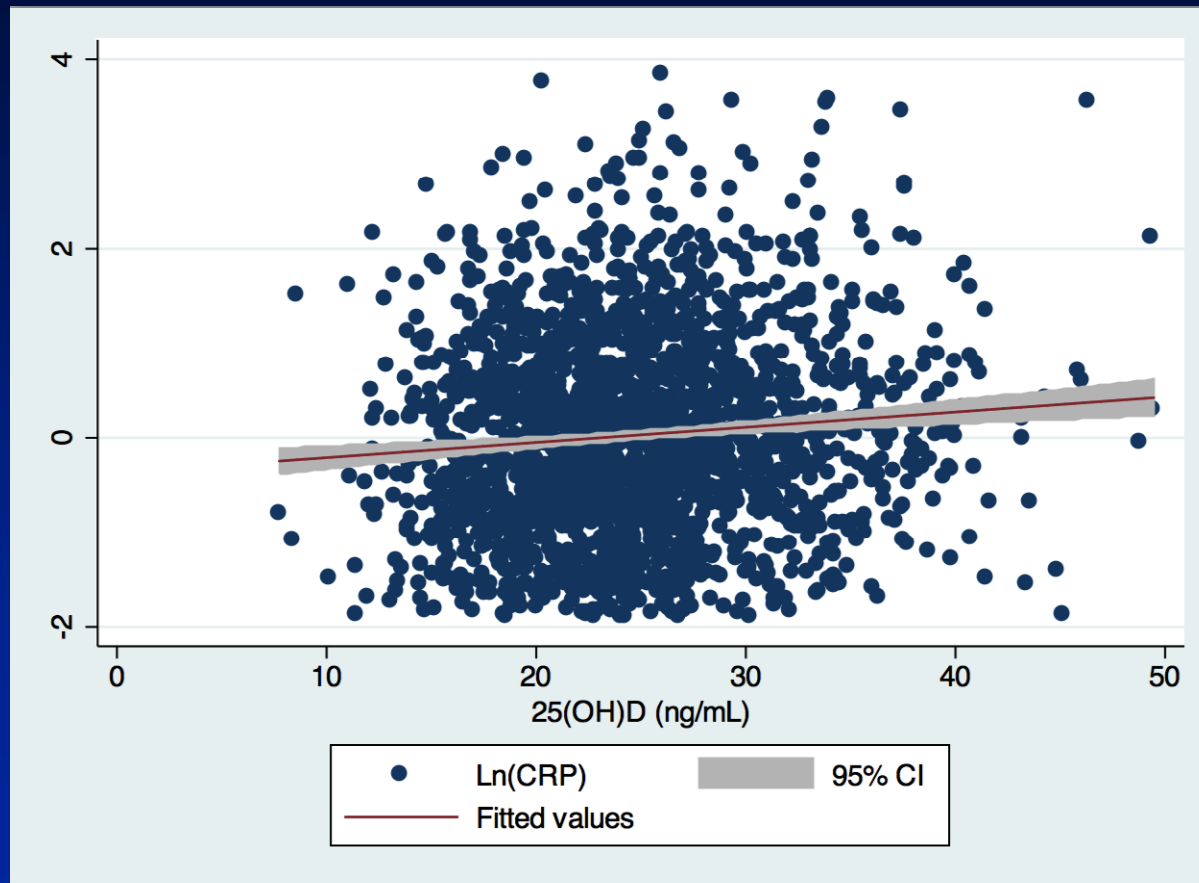
Mendelian Randomization Analysis



Effect C = Effect A + Effect B

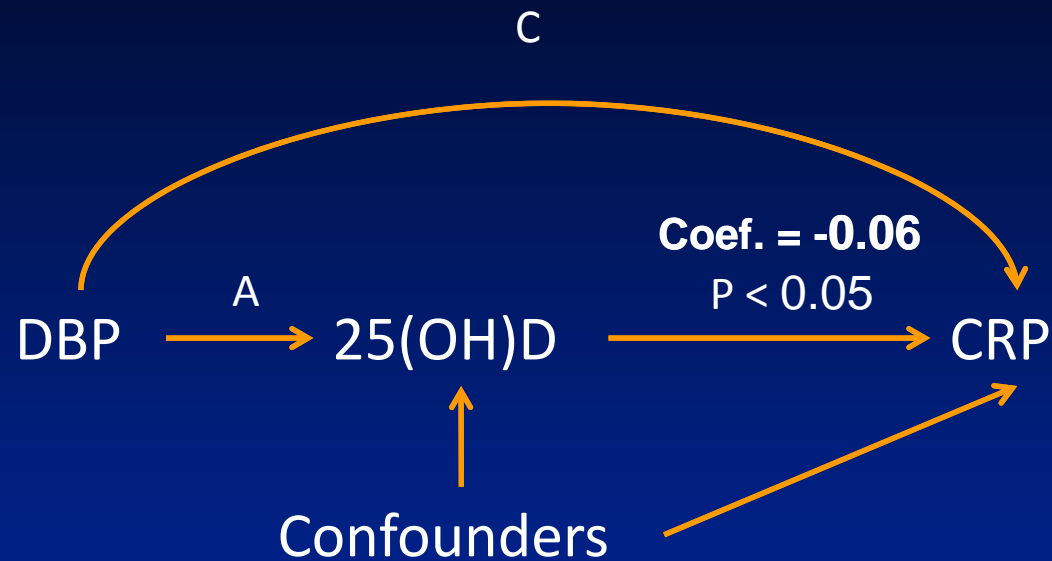
Effect B can be statistically estimated from C and A

Relationship between 25(OH)D and CRP



Coef. = 0.01
P < 0.01

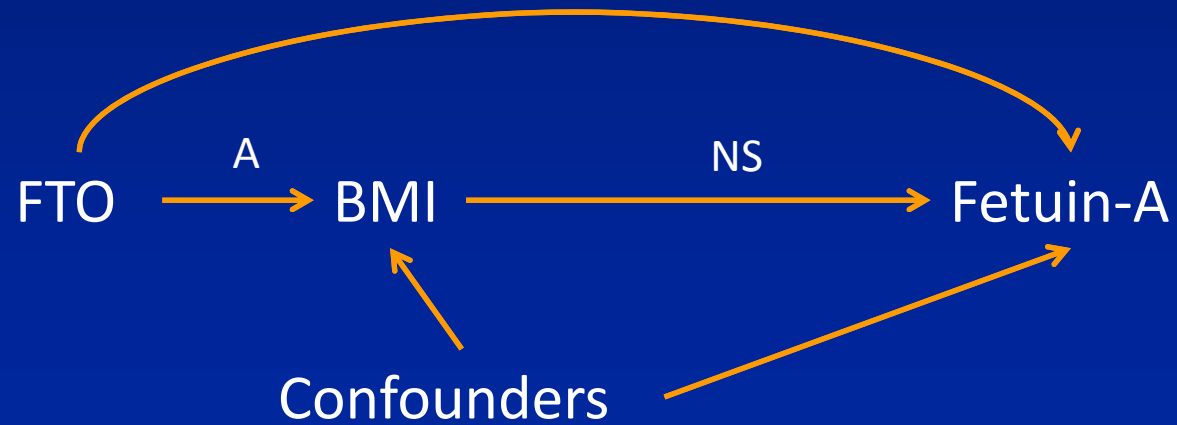
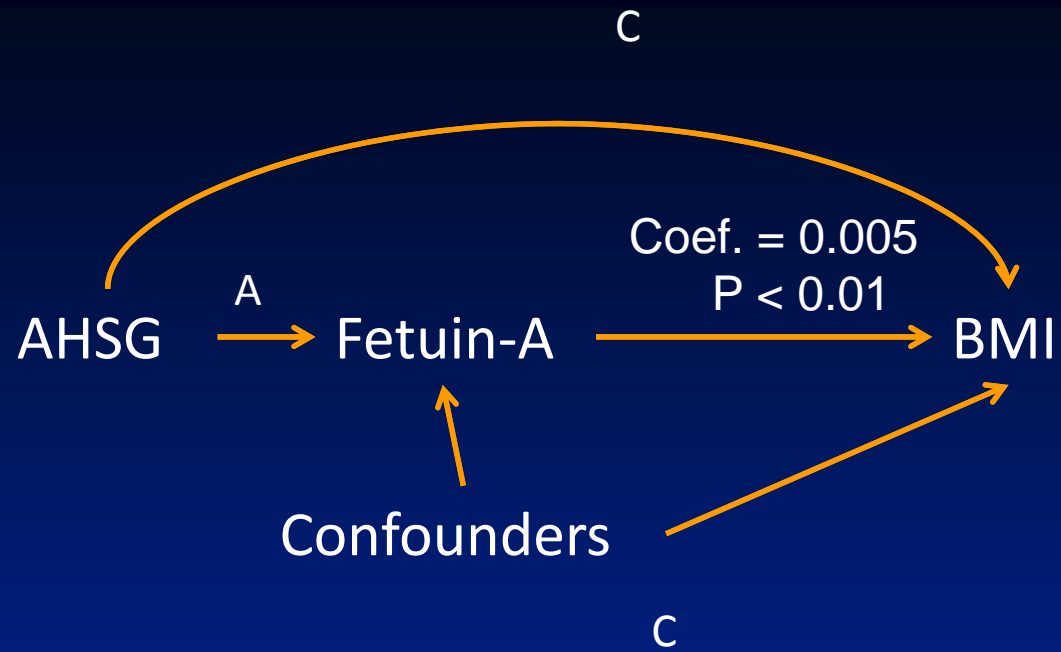
Causal Effect of Vitamin D on CRP



Male, > 40 years old, BMI > 23 kg/m²

Fetuin-A

- Fetuin-A is a multifunctional protein of hepatic origin
- Association studies in humans have found association between circulating fetuin- A levels and body mass index (BMI) as well as components of the metabolic syndrome



Extended-Release Niacin Decreases Serum Fetuin-A

