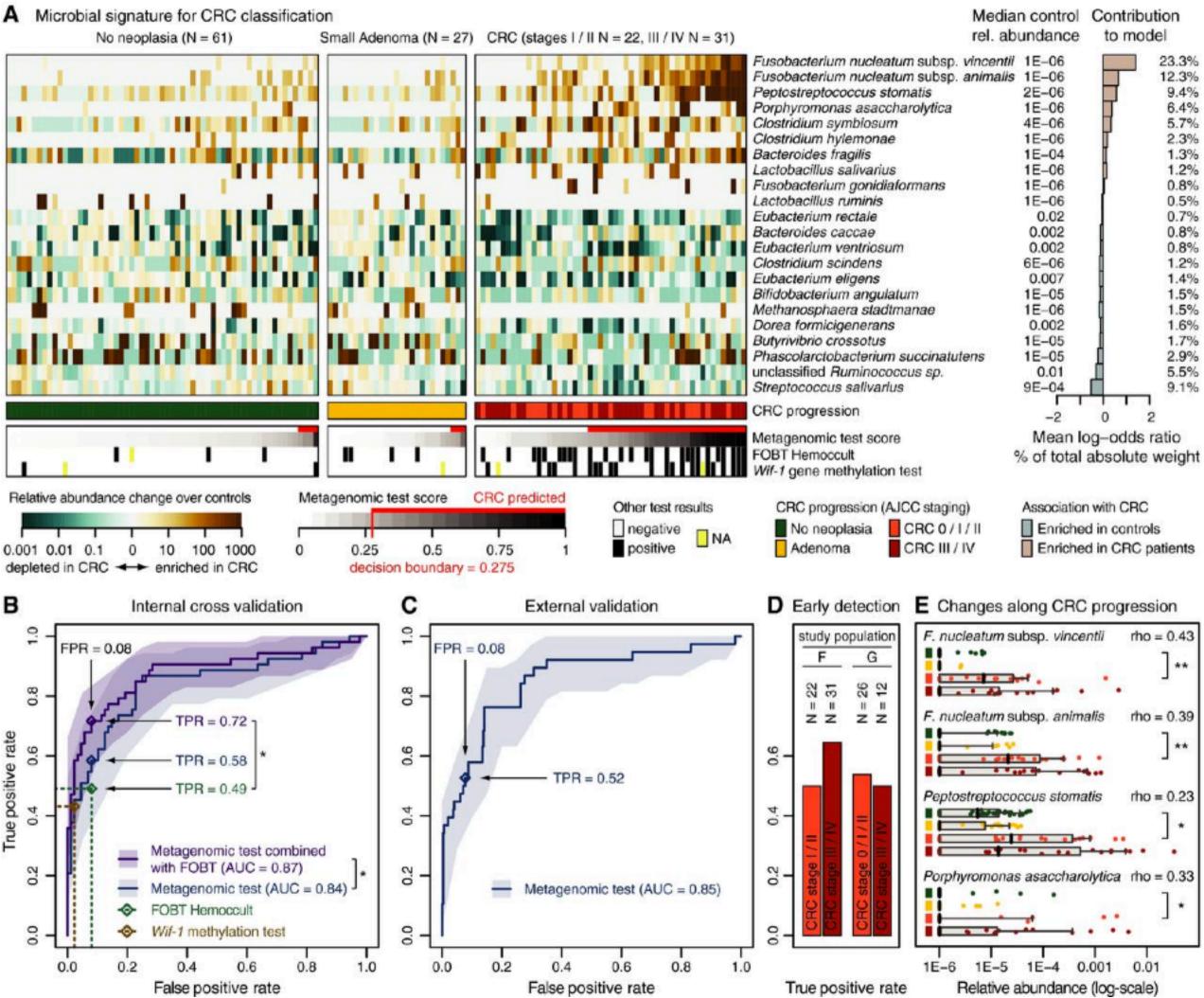




#### Search for markers



### Potential of fecal microbiota for early-stage detection of colorectal cancer

Georg Zeller, Julien Tap, Anita Y Voigt, Shinichi Sunagawa, Jens Roat Kultima, Paul I Costea, Aurélien Amiot, Jürgen Böhm, Francesco Brunetti, Nina Habermann, Rajna Hercog, Moritz Koch, Alain Luciani, Daniel R Mende, Martin A Schneider, Petra Schrotz-King, Christophe Tournigand, Jeanne Tran Van Nhieu, Takuji Yamada, Jürgen Zimmermann, Vladimir Benes, Matthias Kloor, Cornelia M Ulrich, Magnus von Knebel Doeberitz, Iradj Sobhani, Peer Bork

### Intestinal microbiota metabolism of L-carnitine, a nutrient in red meat, promotes atherosclerosis

Robert A Koeth<sup>1,2</sup>, Zeneng Wang<sup>1,2</sup>, Bruce S Levison<sup>1,2</sup>, Jennifer A Buffa<sup>1,2</sup>, Elin Org<sup>3</sup>, Brendan T Sheehy<sup>1</sup>, Earl B Britt<sup>1,2</sup>, Xiaoming Fu<sup>1,2</sup>, Yuping Wu<sup>4</sup>, Lin Li<sup>1,2</sup>, Jonathan D Smith<sup>1,2,5</sup>, Joseph A DiDonato<sup>1,2</sup>, Jun Chen<sup>6</sup>, Hongzhe Li<sup>6</sup>, Gary D Wu<sup>7</sup>, James D Lewis<sup>6,8</sup>, Manya Warrier<sup>9</sup>, J Mark Brown<sup>9</sup>, Ronald M Krauss<sup>10</sup>, W H Wilson Tang<sup>1,2,5</sup>, Frederic D Bushman<sup>5</sup>, Aldons J Lusis<sup>3</sup> & Stanley L Hazen<sup>1,2,5</sup>

#### ARTICLE

## Gut flora metabolism of phosphatidylcholine promotes cardiovascular disease

Zeneng Wang<sup>1,2</sup>, Elizabeth Klipfell<sup>1,2</sup>, Brian J. Bennett<sup>3</sup>, Robert Koeth<sup>1</sup>, Bruce S. Levison<sup>1,2</sup>, Brandon DuGar<sup>1</sup>, Ariel E. Feldstein<sup>1,2</sup>, Earl B. Britt<sup>1,2</sup>, Xiaoming Fu<sup>1,2</sup>, Yoon–Mi Chung<sup>1,2</sup>, Yuping Wu<sup>4</sup>, Phil Schauer<sup>5</sup>, Jonathan D. Smith<sup>1,6</sup>, Hooman Allayee<sup>7</sup>, W. H. Wilson Tang<sup>1,2,6</sup>, Joseph A. DiDonato<sup>1,2</sup>, Aldons J. Lusis<sup>3</sup> & Stanley L. Hazen<sup>1,2,6</sup>

# The NEW ENGLAND JOURNAL of MEDICINE

Intestinal Microbial Metabolism of Phosphatidylcholine

APRIL 25, 2013

VOL. 368

NO. 17

and Cardiovascular Risk

ESTABLISHED IN 1812

W.H. Wilson Tang, M.D., Zeneng Wang, Ph.D., Bruce S. Levison, Ph.D., Robert A. Koeth, B.S., Earl B. Britt, M.D., Xiaoming Fu, M.S., Yuping Wu, Ph.D., and Stanley L. Hazen, M.D., Ph.D.

#### **Search for markers**



### Intestinal microbiota metabolism of L-carnitine, a nutrient in red meat, promotes atherosclerosis

Robert A Koeth<sup>1,2</sup>, Zeneng Wang<sup>1,2</sup>, Bruce S Levison<sup>1,2</sup>, Jennifer A Buffa<sup>1,2</sup>, Elin Org<sup>3</sup>, Brendan T Sheehy<sup>1</sup>, Earl B Britt<sup>1,2</sup>, Xiaoming Fu<sup>1,2</sup>, Yuping Wu<sup>4</sup>, Lin Li<sup>1,2</sup>, Jonathan D Smith<sup>1,2,5</sup>, Joseph A DiDonato<sup>1,2</sup>, Jun Chen<sup>6</sup>, Hongzhe Li<sup>6</sup>, Gary D Wu<sup>7</sup>, James D Lewis<sup>6,8</sup>, Manya Warrier<sup>9</sup>, J Mark Brown<sup>9</sup>, Ronald M Krauss<sup>10</sup>, W H Wilson Tang<sup>1,2,5</sup>, Frederic D Bushman<sup>5</sup>, Aldons J Lusis<sup>3</sup> & Stanley L Hazen<sup>1,2,5</sup>

#### **ARTICLE**

doi:10.1038/nature09922

## Gut flora metabolism of phosphatidylcholine promotes cardiovascular disease

Zeneng Wang<sup>1,2</sup>, Elizabeth Klipfell<sup>1,2</sup>, Brian J. Bennett<sup>3</sup>, Robert Koeth<sup>1</sup>, Bruce S. Levison<sup>1,2</sup>, Brandon DuGar<sup>1</sup>, Ariel E. Feldstein<sup>1,2</sup>, Earl B. Britt<sup>1,2</sup>, Xiaoming Fu<sup>1,2</sup>, Yoon–Mi Chung<sup>1,2</sup>, Yuping Wu<sup>4</sup>, Phil Schauer<sup>5</sup>, Jonathan D. Smith<sup>1,6</sup>, Hooman Allayee<sup>7</sup>, W. H. Wilson Tang<sup>1,2,6</sup>, Joseph A. DiDonato<sup>1,2</sup>, Aldons J. Lusis<sup>3</sup> & Stanley L. Hazen<sup>1,2,6</sup>

# The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

APRIL 25, 2013

VOL. 368 NO. 17

### Intestinal Microbial Metabolism of Phosphatidylcholine and Cardiovascular Risk

W.H. Wilson Tang, M.D., Zeneng Wang, Ph.D., Bruce S. Levison, Ph.D., Robert A. Koeth, B.S., Earl B. Britt, M.D., Xiaoming Fu, M.S., Yuping Wu, Ph.D., and Stanley L. Hazen, M.D., Ph.D.

### Marcadores Reprodutíveis

Instituto René Rachou FIOCRUZ MINAS

- Encontrar marcadores nãoaleatórios que podem ser usados em modelos.
- Separar marcadores espúrios dos reprodutíveis.

