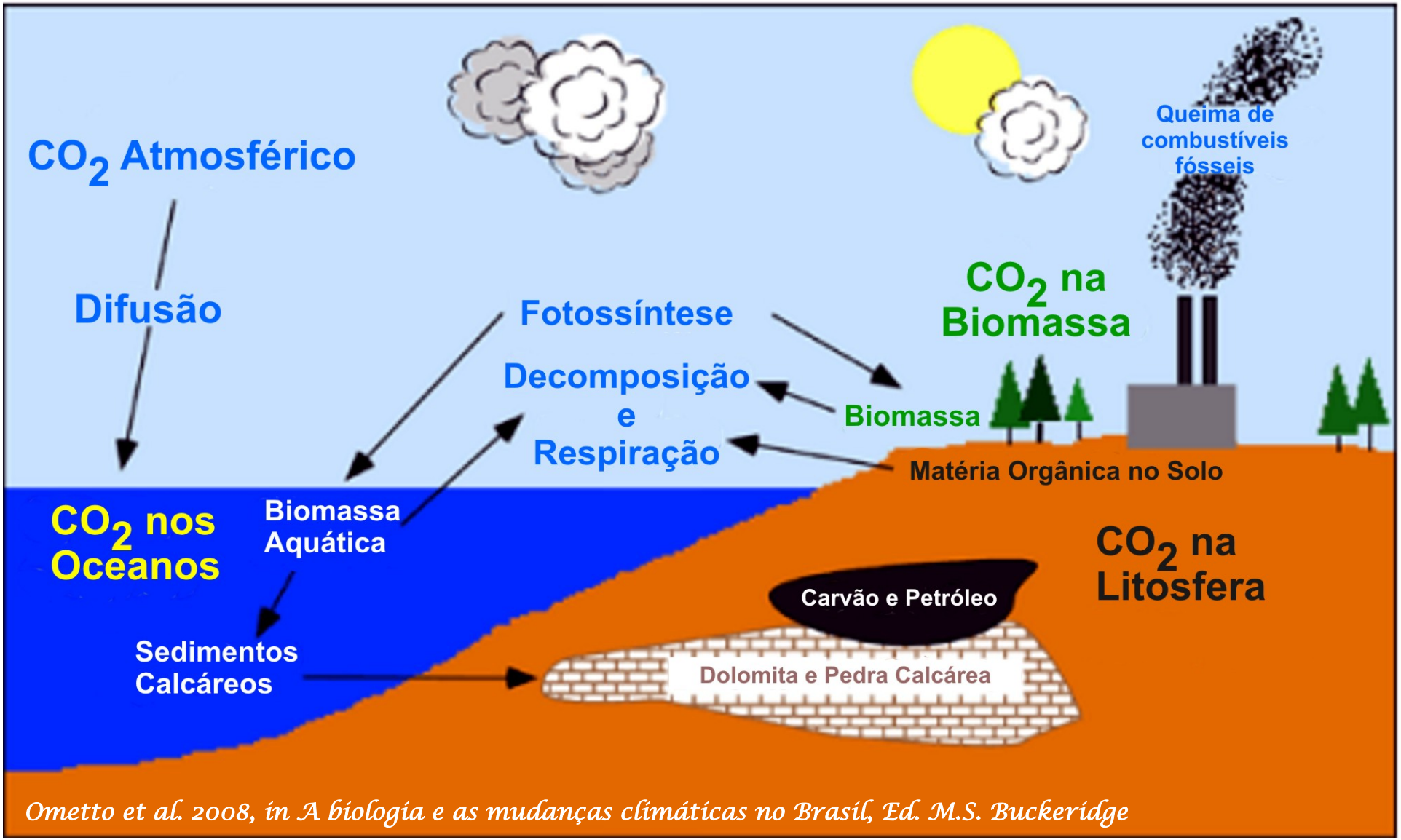
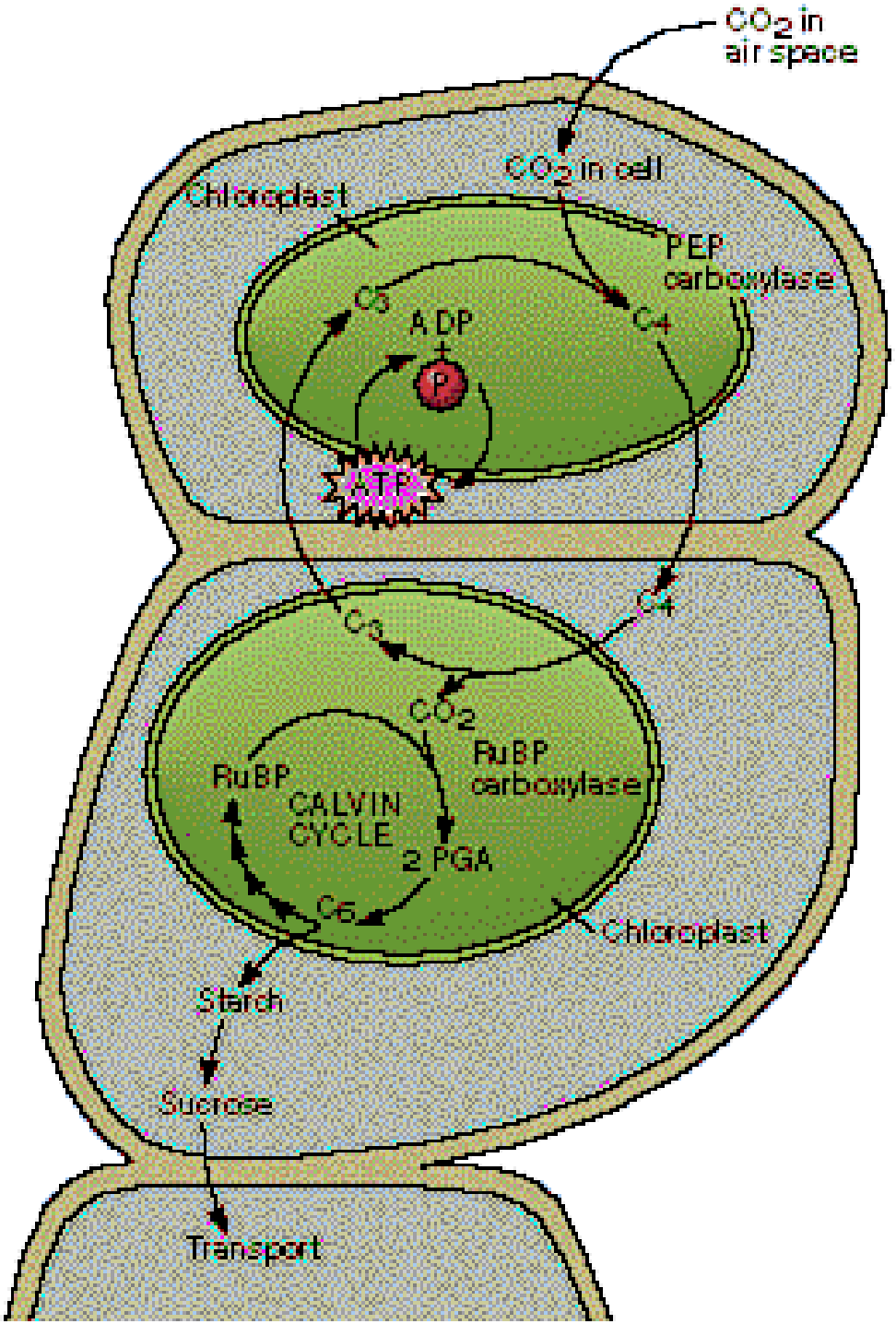
ROTAS PARA O ETANOL CELULÓSICO EM UM CENÁRIO DE MUDANÇAS CLIMÁTICAS

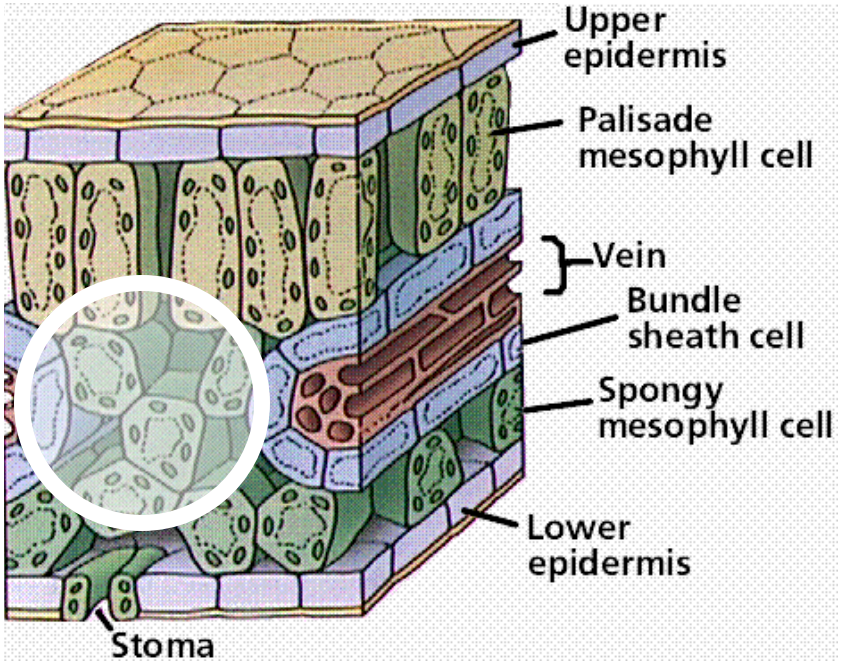
Marcos Buckeridge
Instituto de Biociências
Departamento de Botânica
USP

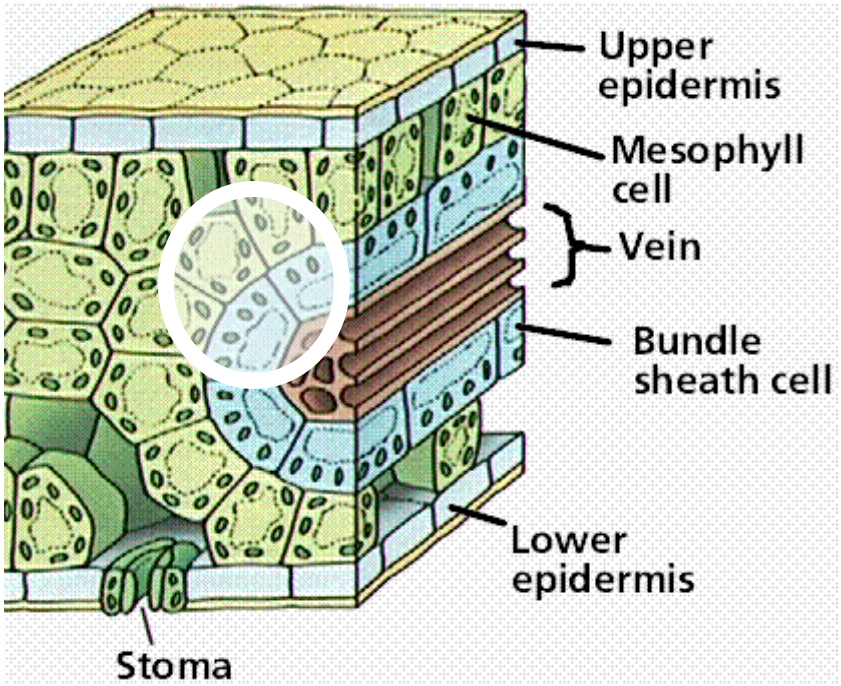
O ciclo do carbono e as mudanças climáticas

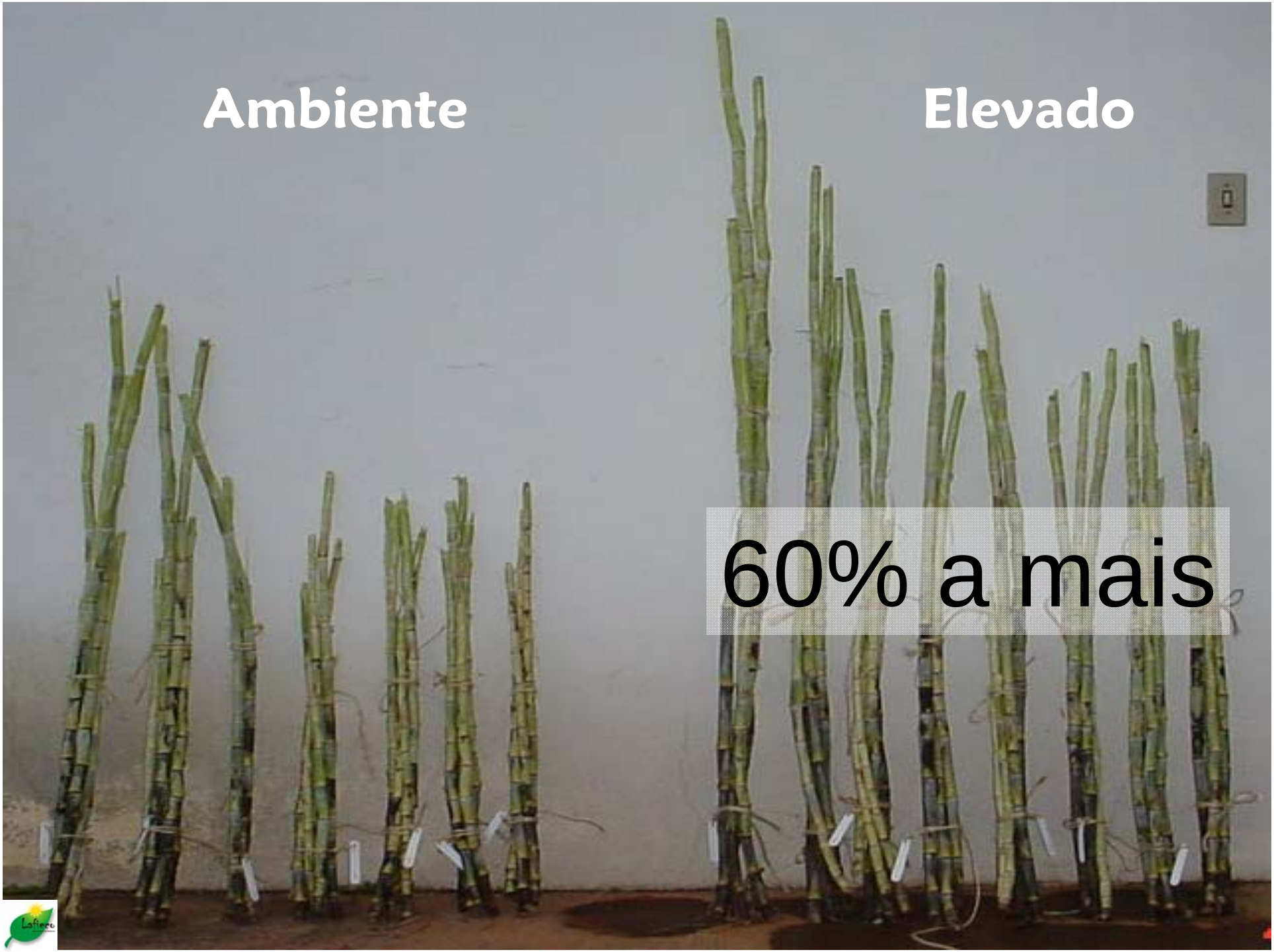


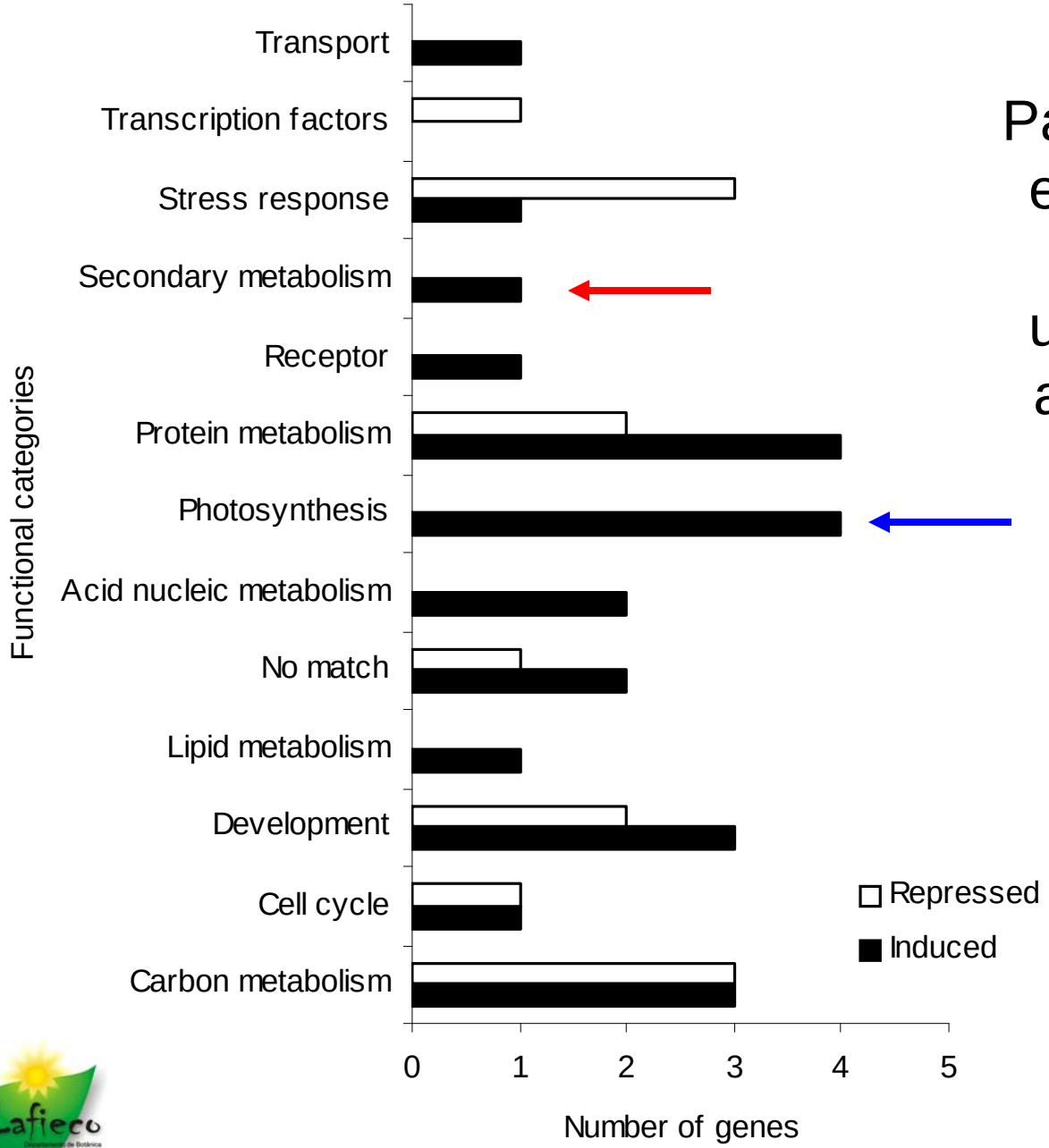
Ometto et al. 2008, in A biologia e as mudanças climáticas no Brasil, Ed. M.S. Buckeridge


CO_2 in air space
CO_2 in cell
Chloroplast
PEP carboxylase
C3
ADP
C4
P
ATP
C4
C3
CO_2
RuBP carboxylase
RuBP
CALVIN CYCLE
2 PGA
C6
Chloroplast
Starch
Sucrose
Transport


Upper epidermis
Palisade mesophyll cell
Vein
Bundle sheath cell
Spongy mesophyll cell
Lower epidermis
Stoma


Upper epidermis
Mesophyll cell
Vein
Bundle sheath cell
Lower epidermis
Stoma


Ambiente
Elevado
60% a mais



Pattern of gene expression in sugarcane under normal and elevated CO_2

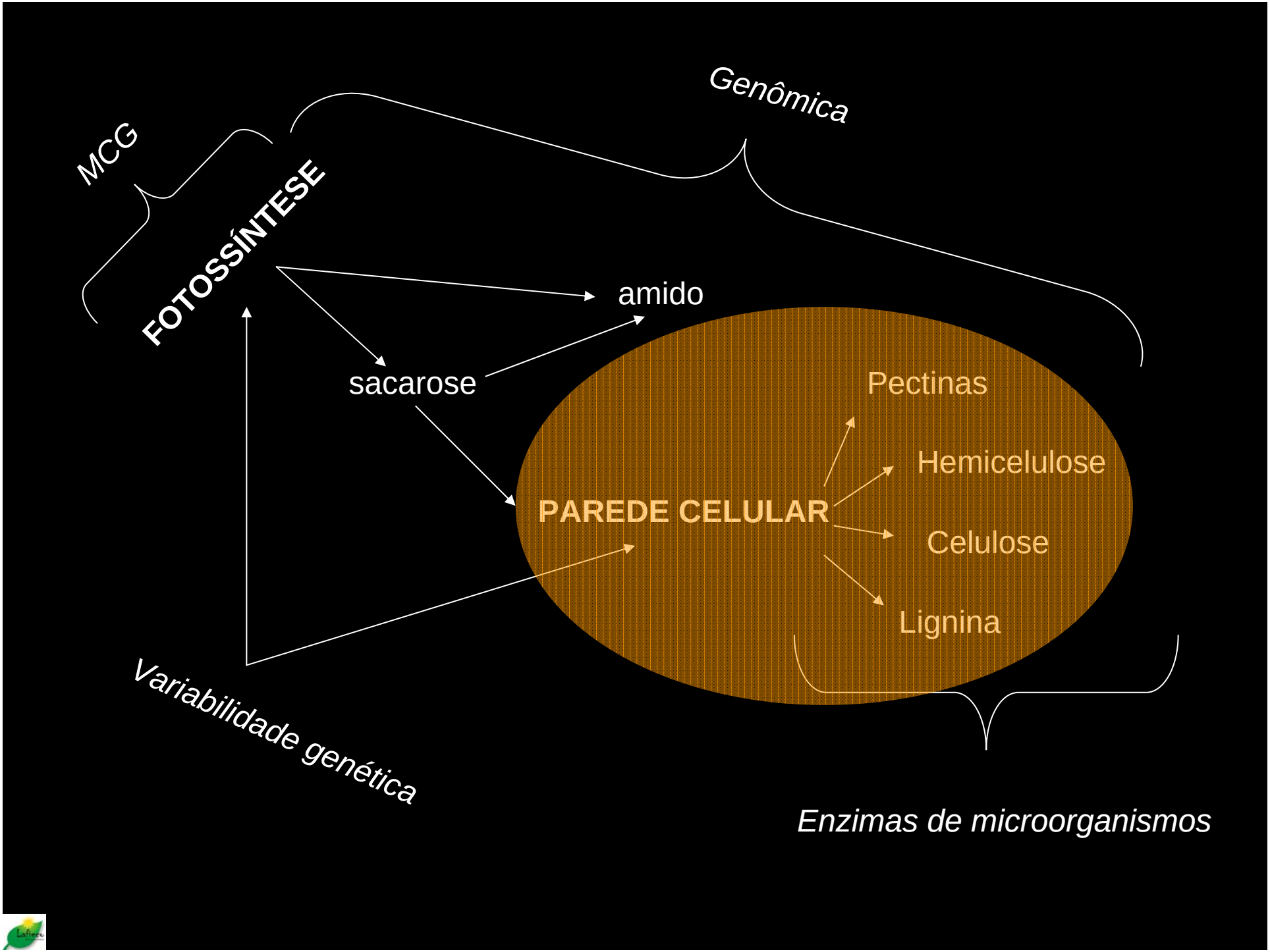
Souza et al. 2008. Plant Cell & Environment. On line first

PERSPECTIVAS DO ETANOL CELULÓSICO

- *Obter mais bioenergia de materiais vegetais, principalmente de cana*

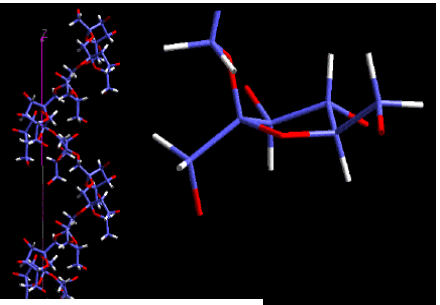
  a) onde está a energia?

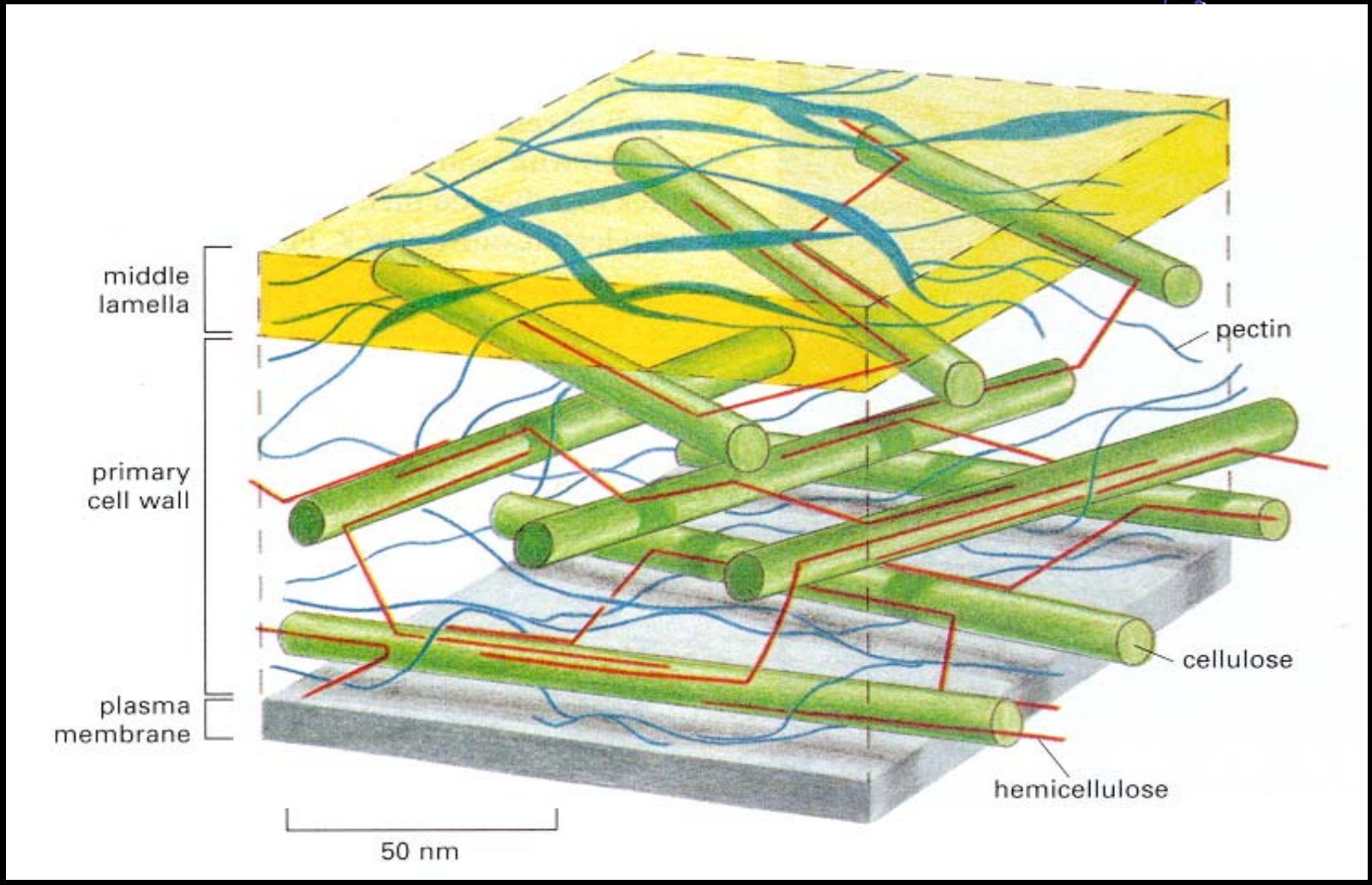
  b) como obtê-la de forma eficiente?


MCG
Genômica
FOTOSSÍNTESE
amido
sacarose
Pectinas
Hemicelulose
PAREDE CELULAR
Celulose
Lignina
Variabilidade genética
Enzimas de microorganismos

A Parede Celular

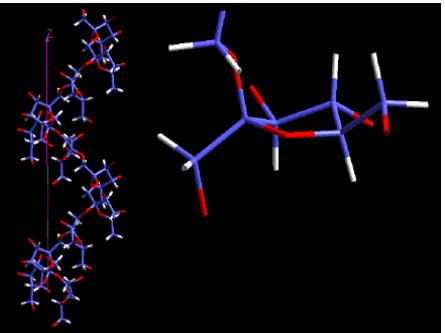
(McCann and Roberts, 1991)

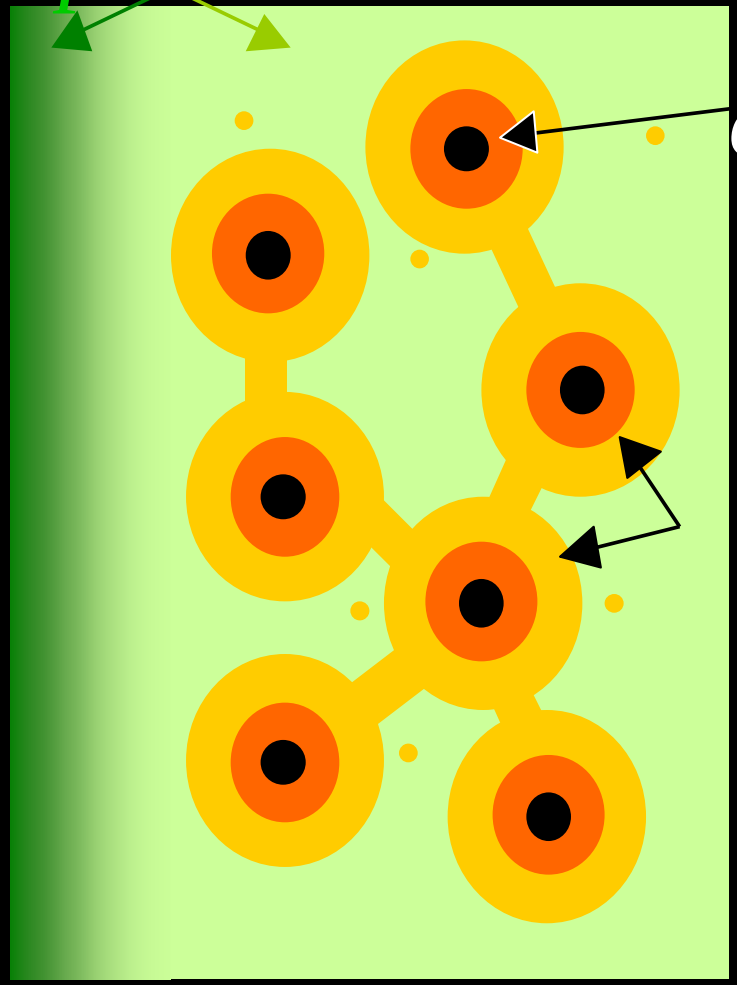




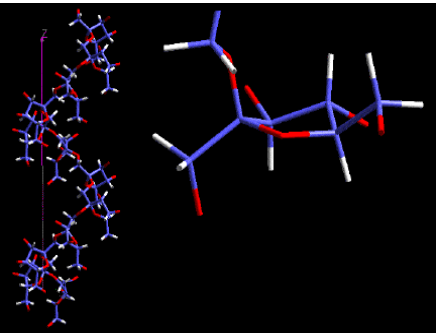
celulose hemicelulose pectinas

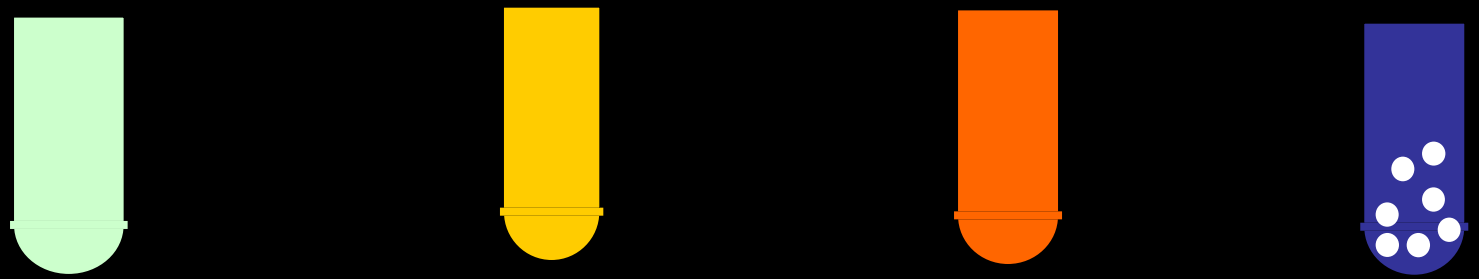
Fracionamento da parede





Fracionamento da Parede



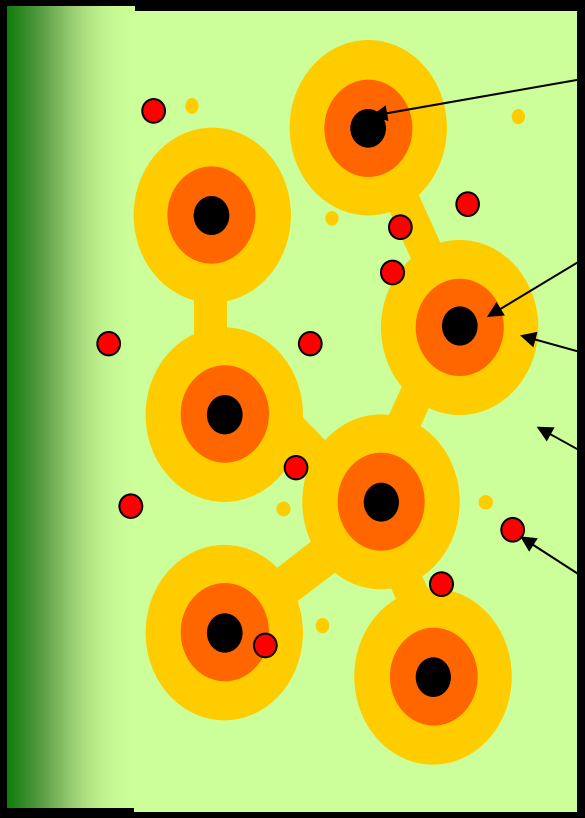


pectinas

hemicelulose
(fracamente ligada)

hemicellulose
(fortemente ligada)

residuo



microfibrila

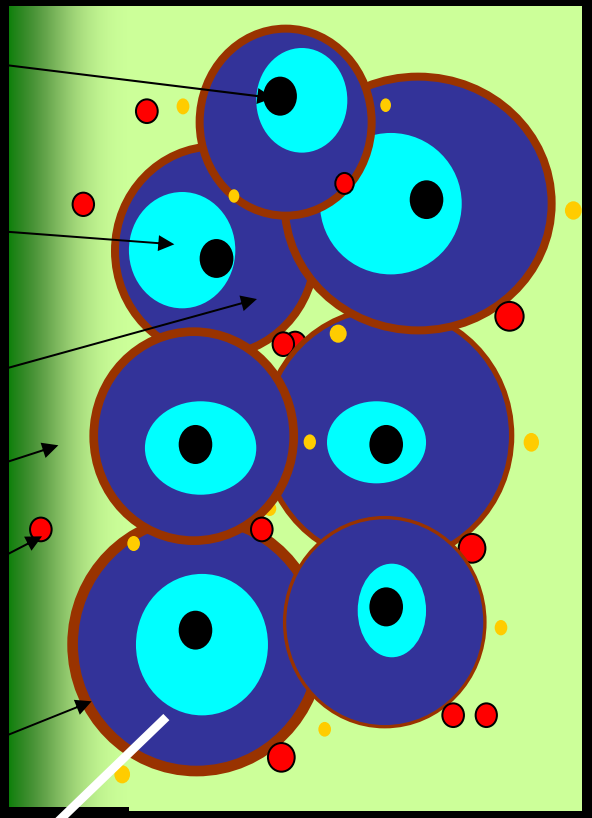
Hemicelulose fortemene aderida à celulose

Hemicelulose fracamente aderida à celulose

Pectinas

Proteínas

Compostos fenólicos



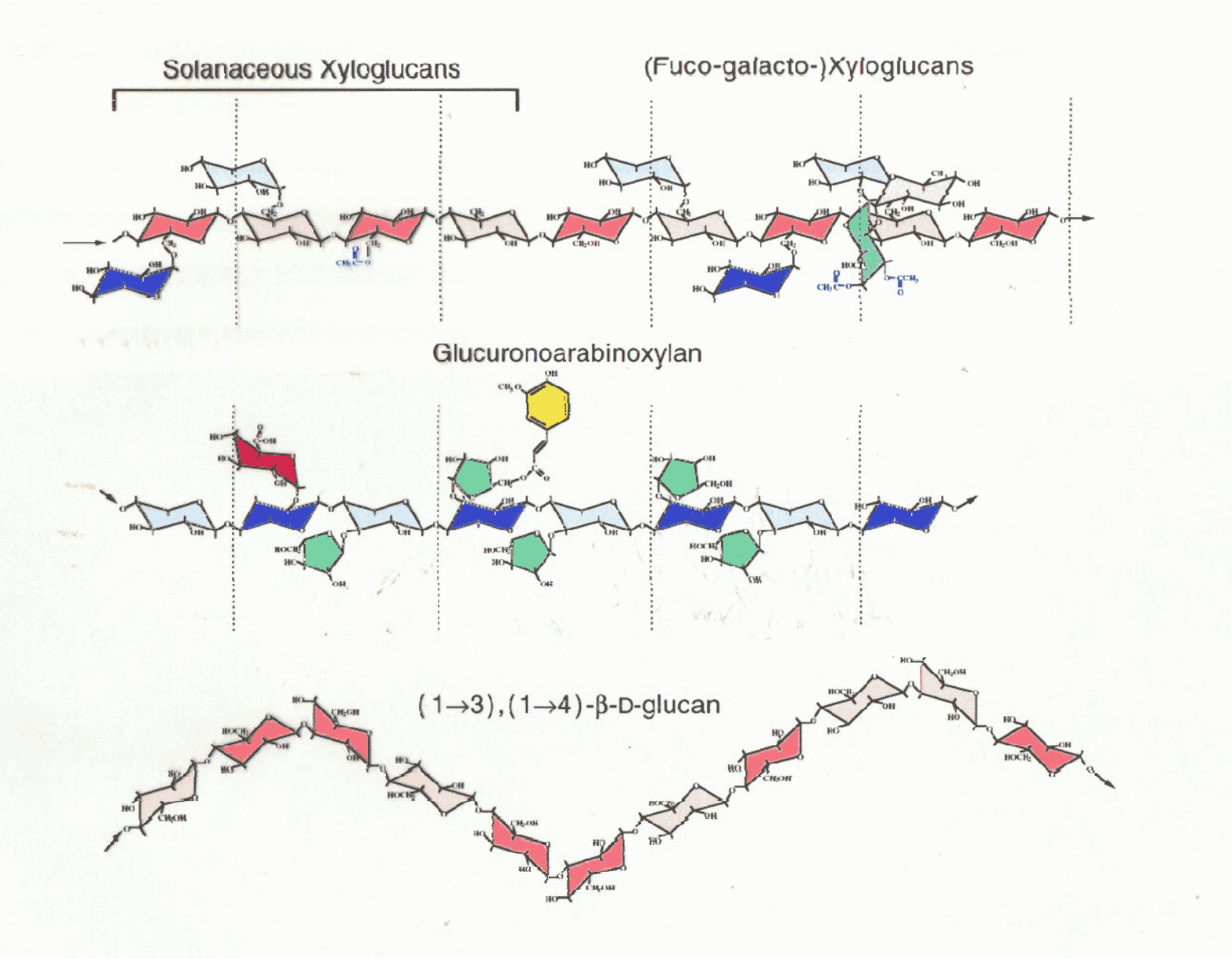
Tipo I

Tipo II

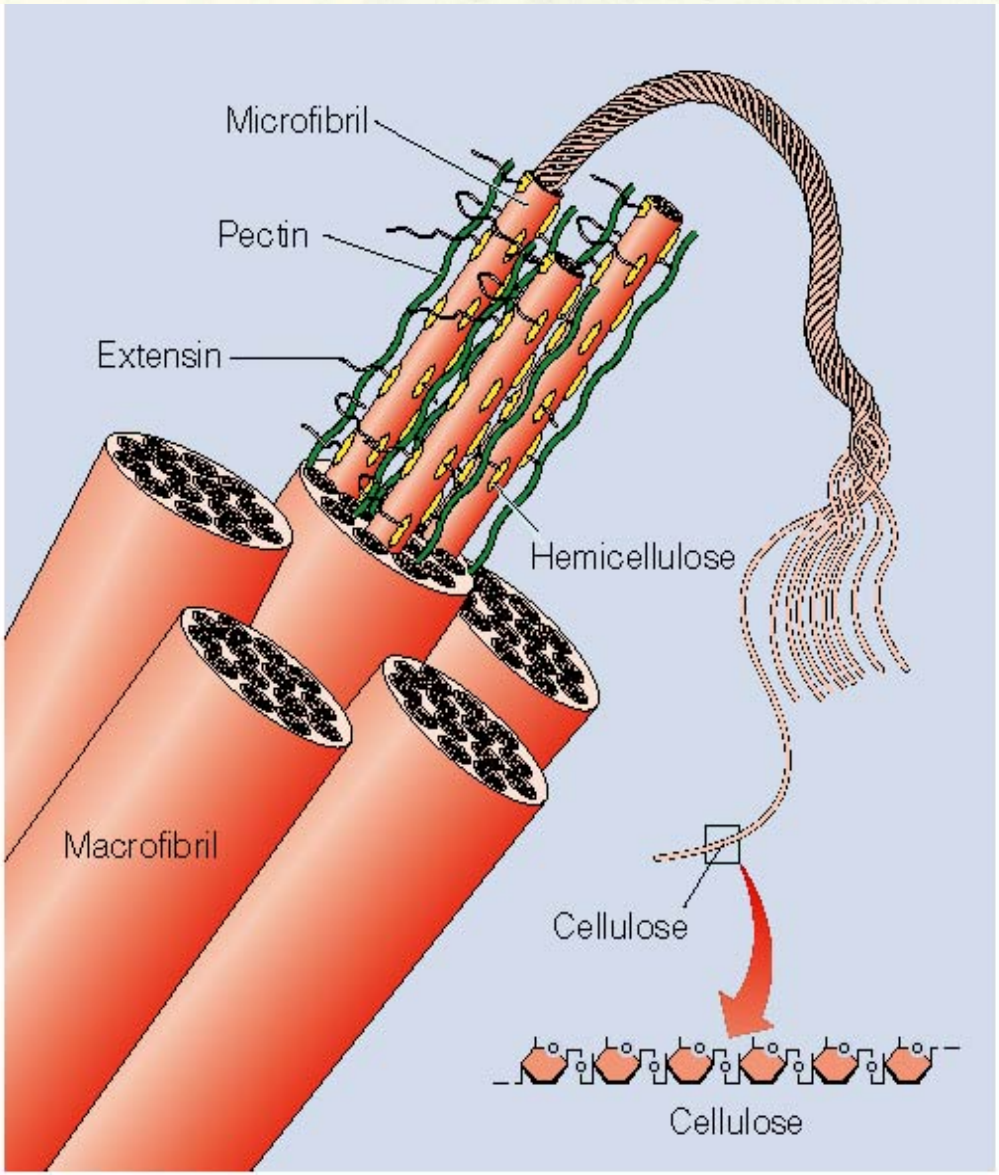
?

Buckeridge et al. 2008, in Fisiologia Vegetal. Ed. G.B. Kerbauy, Guanabara Koogan

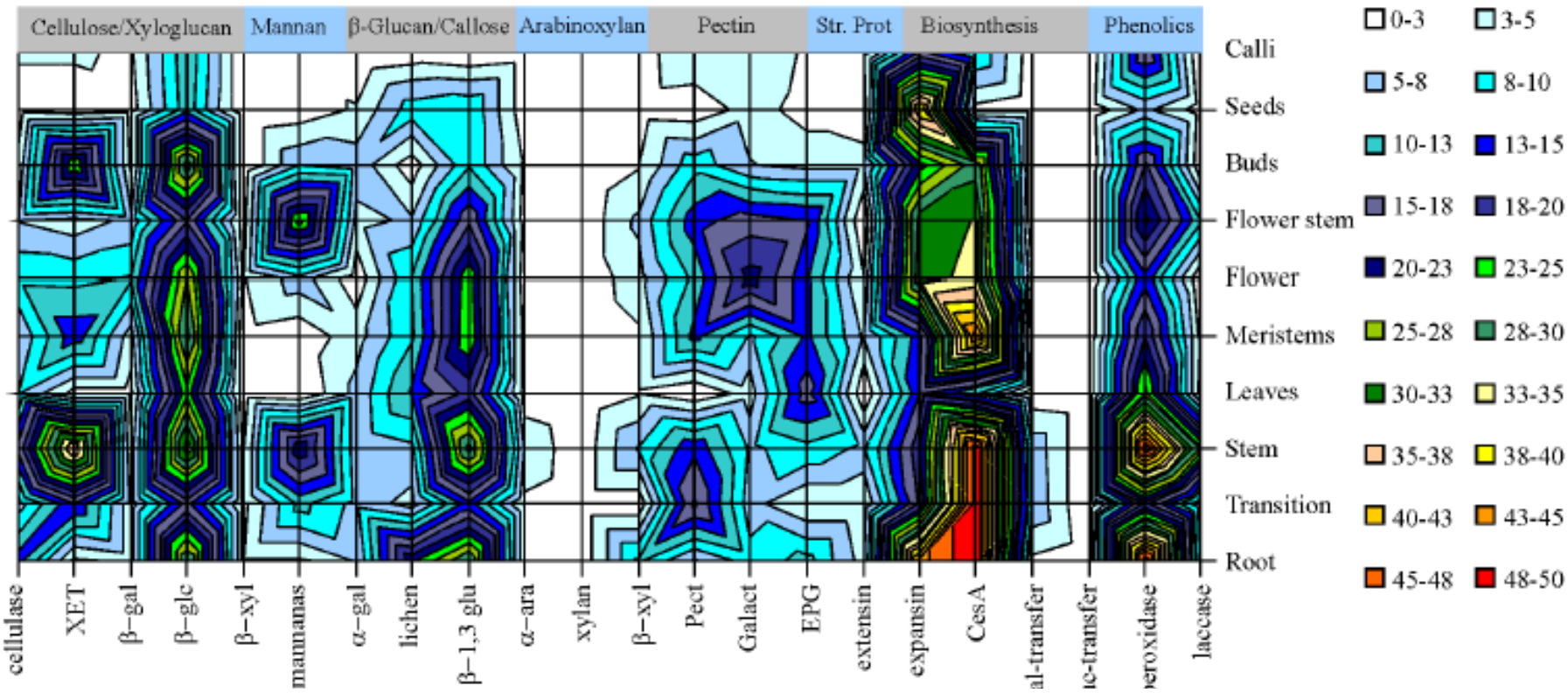
Hemiceluloses de cana



Como são montados os polímeros da parede



From 1999 to 2001, the SUCEST genome program produced 238,000 ESTs from various tissues of the sugar cane plant.

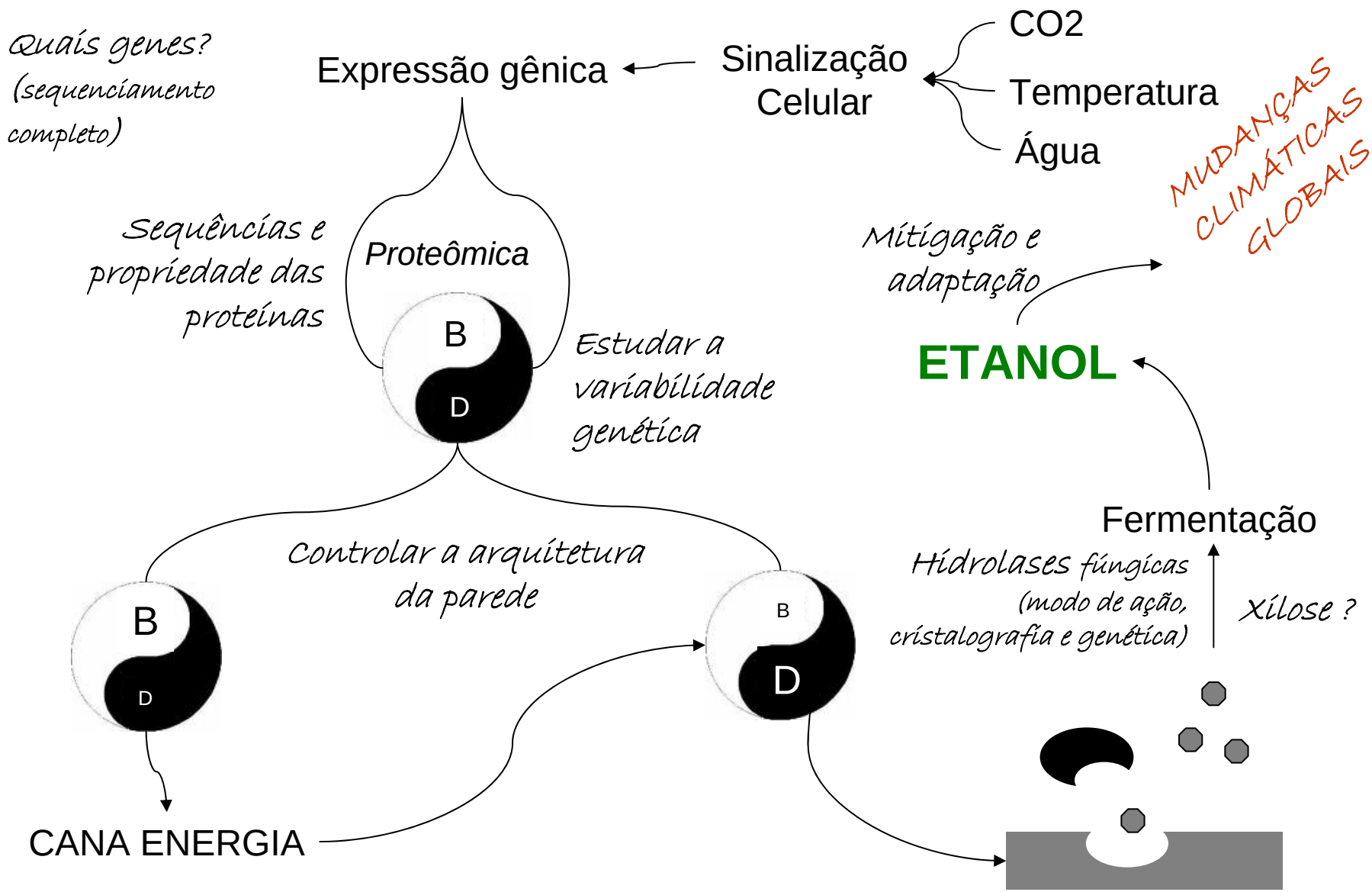


Since then we found:

1) 469 cell wall related genes in different cane tissues (*Lima et al. 2001, GMB*)

1) Determined the chemical composition and structure of the cell wall polymers of different sugarcane tissues

ROTAS PARA O ETANOL LIGNOCELULÓSICO



I Simpósio de Etanol Celulósico IB-USP 9 e 10 de setembro 2008

2nd Pan American Congress on Plants and Bioenergy 2010 in São Paulo

Marcos Buckeridge
msbuck@usp.br