

Diabetes and UTI



- Increased incidence/prevalence
 - Symptomatic UTI
 - ASB
 - Relationship of ASB to Sx UTI

Diabetes and UTI

- Risk factors (med vs. urologic)
 - PH of UTI, coitus, vag EC
 - Insulin, OH, control, BMI
 - Structural/functional abnormality
 - Catheter
 - Severity/duration, angiopathy, PMN
 - Race, ethnicity

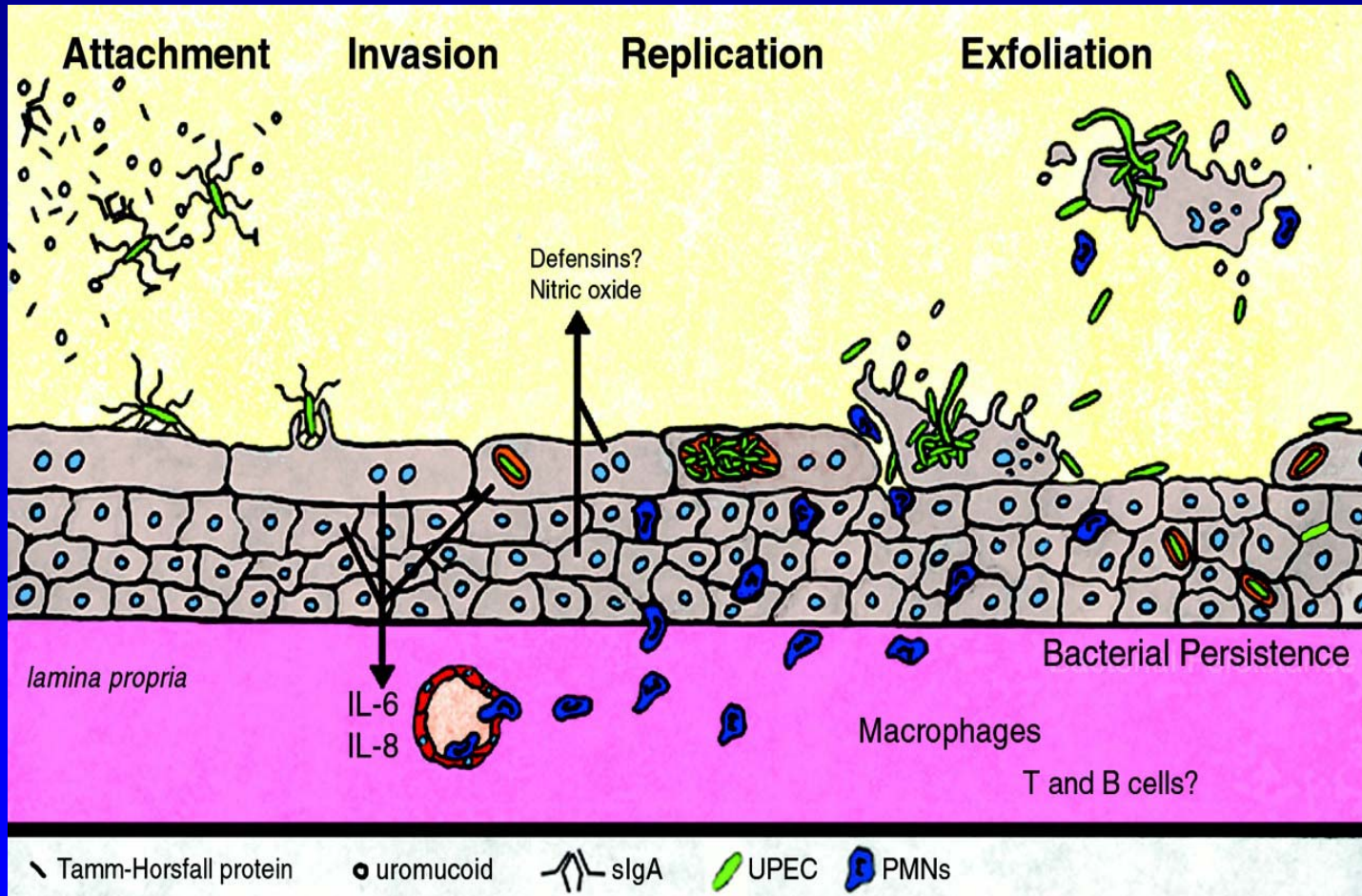
Shortcomings of Many earlier Studies

- Few cohort studies, generally case/control, cross-sectional, retrospective
- Most done in women, Type II
- No adjustment for comorbidities
- Done before modern glycemic control

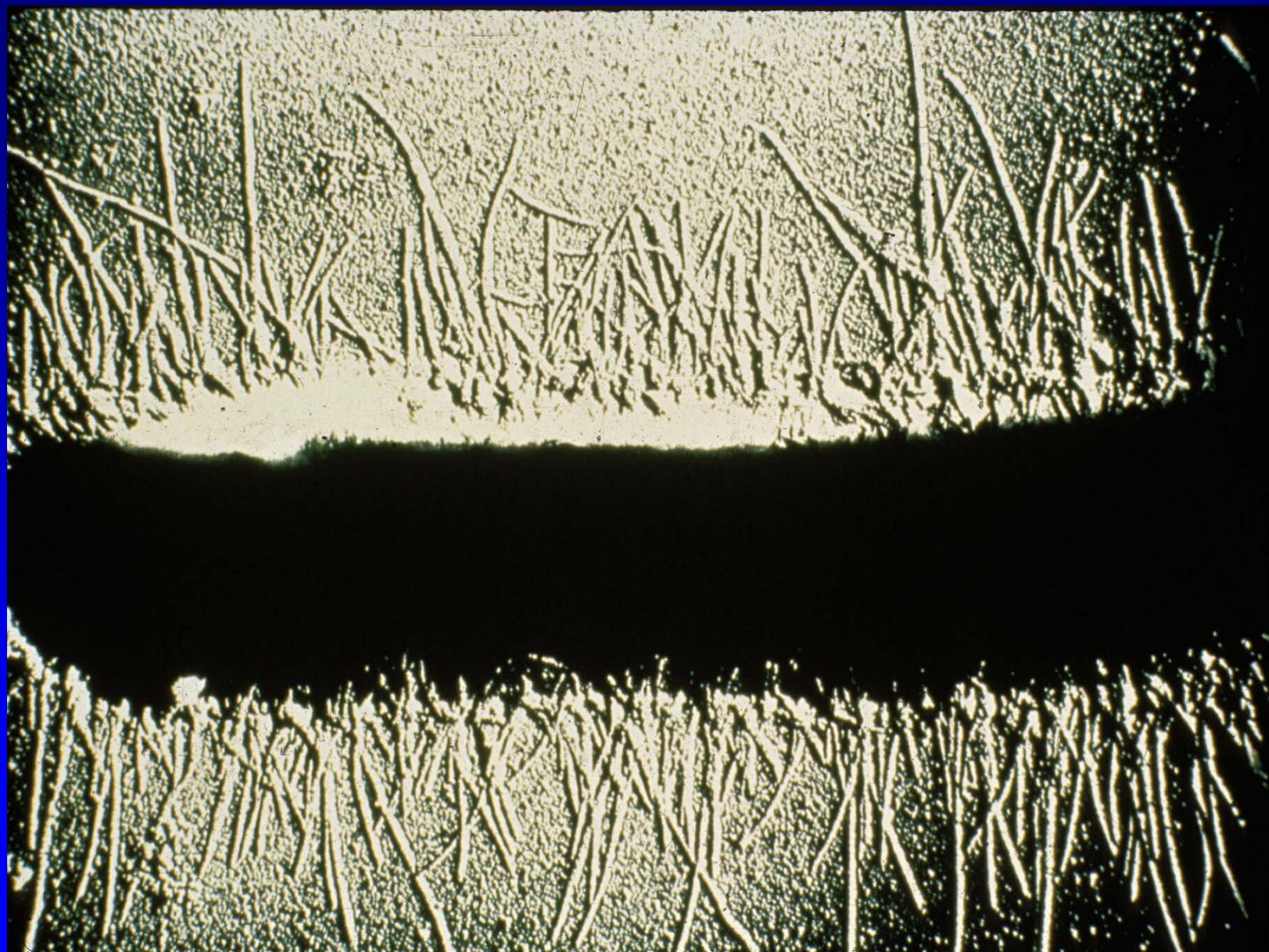
Newer Concepts of UTI Pathogenesis

- Vaginal ecology and EC colonization
- Urovirulence in E.coli
- Mucosal host response and innate immunity
- Bacterial invasion

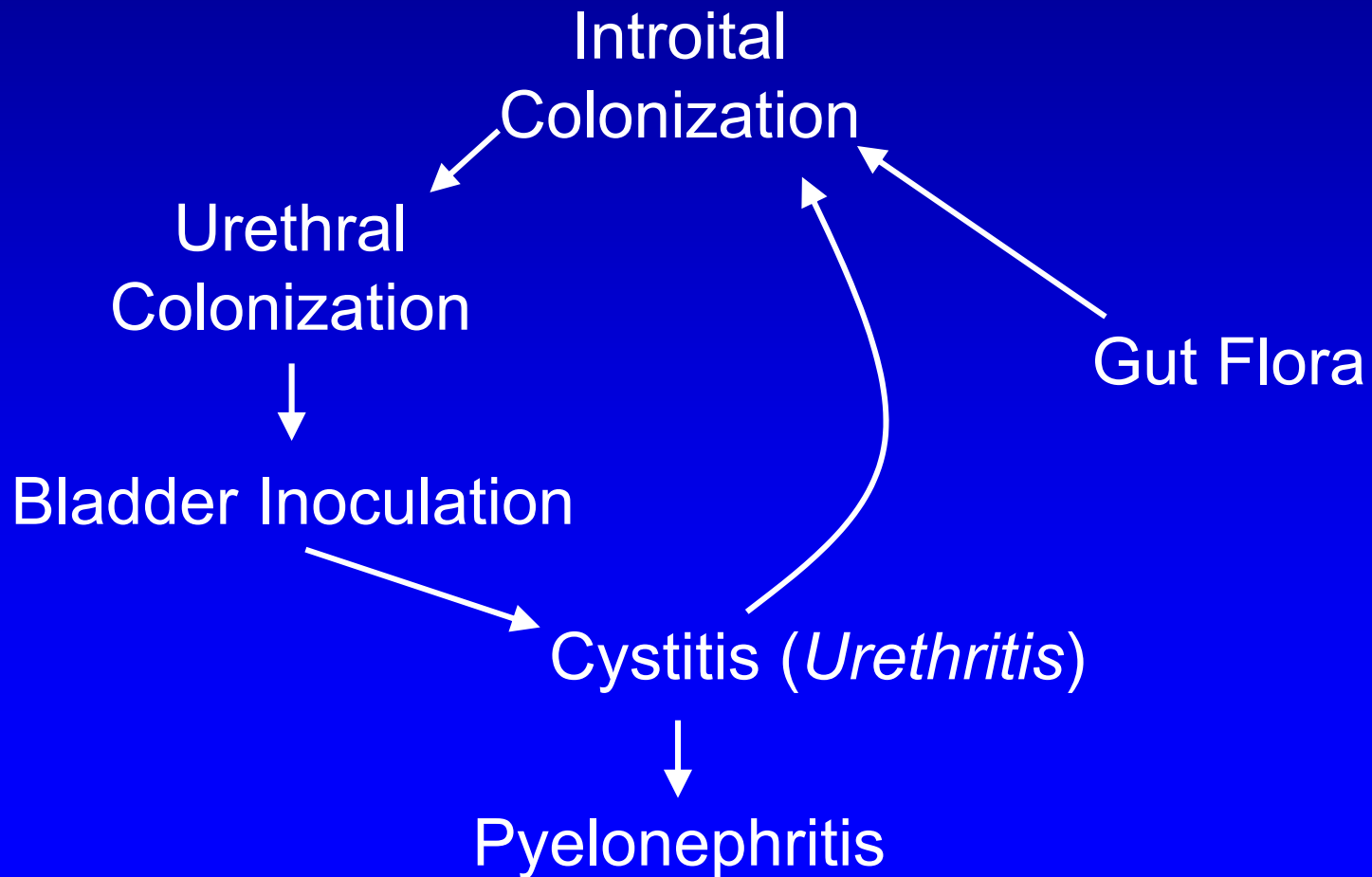
Interplay Between Innate Host Defenses and UPEC within the Bladder

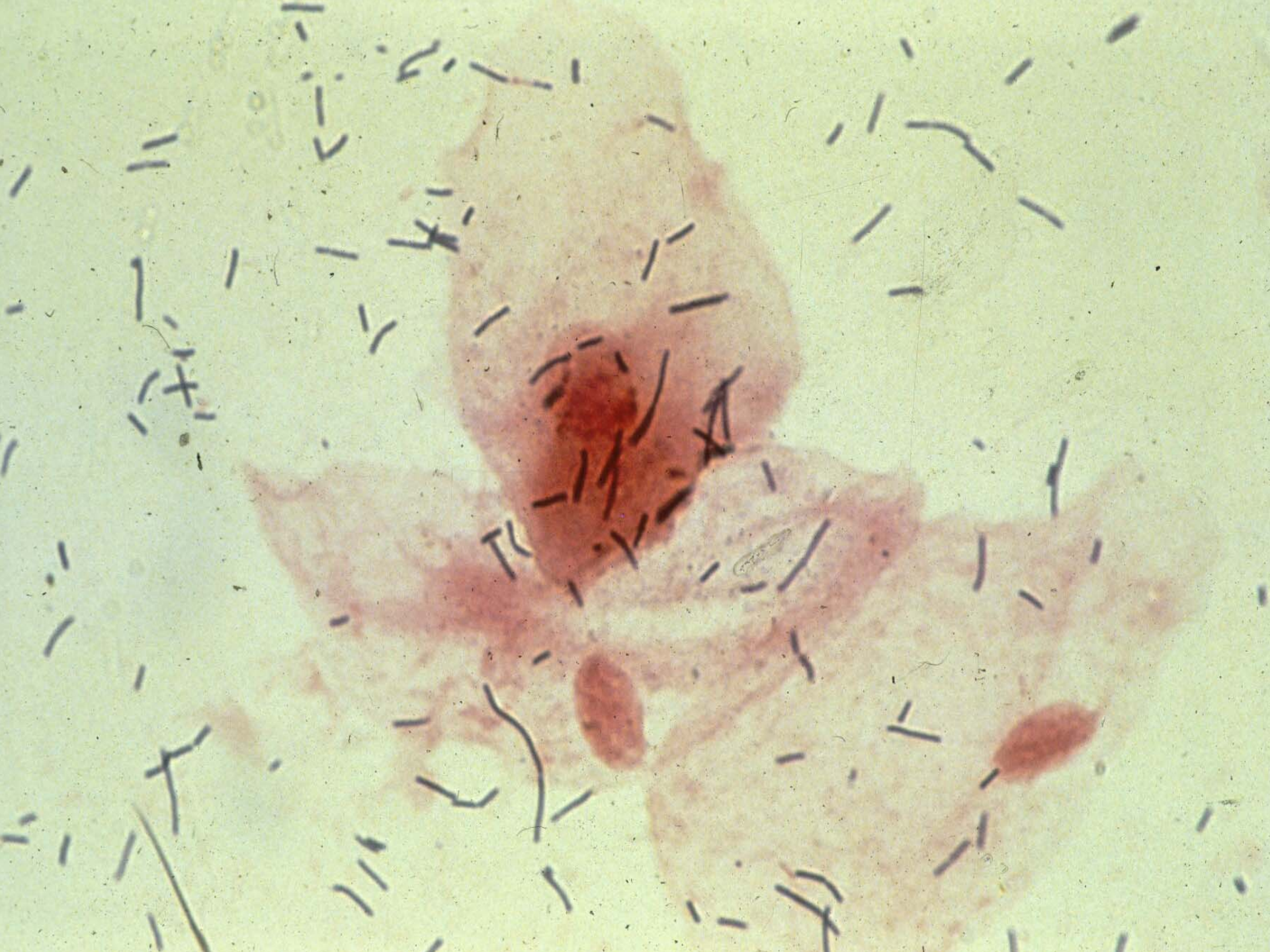


PNAS. 2000; 97:8834

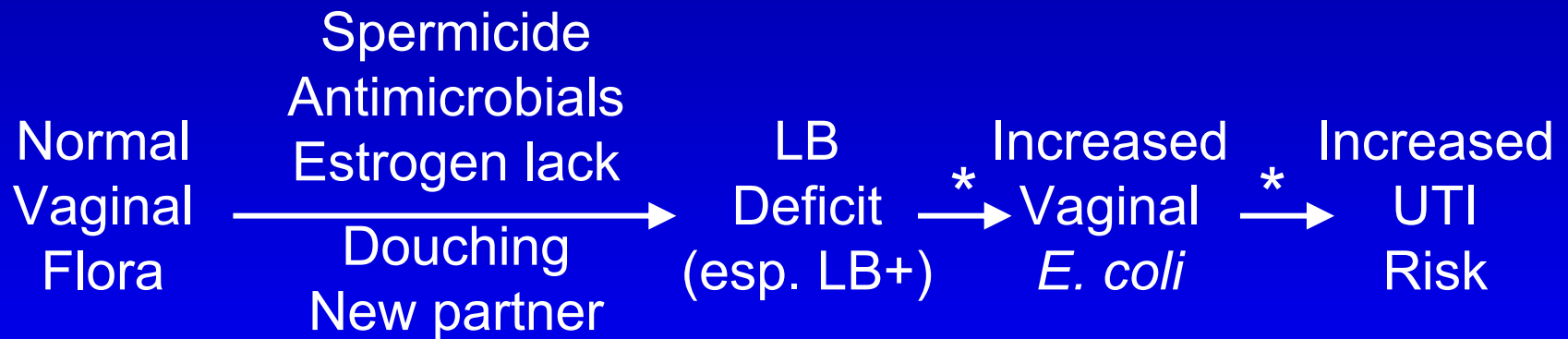


Postulated Sequence of Events in Urinary Tract Infection





Altered Microbial Ecology of Vagina and UTI

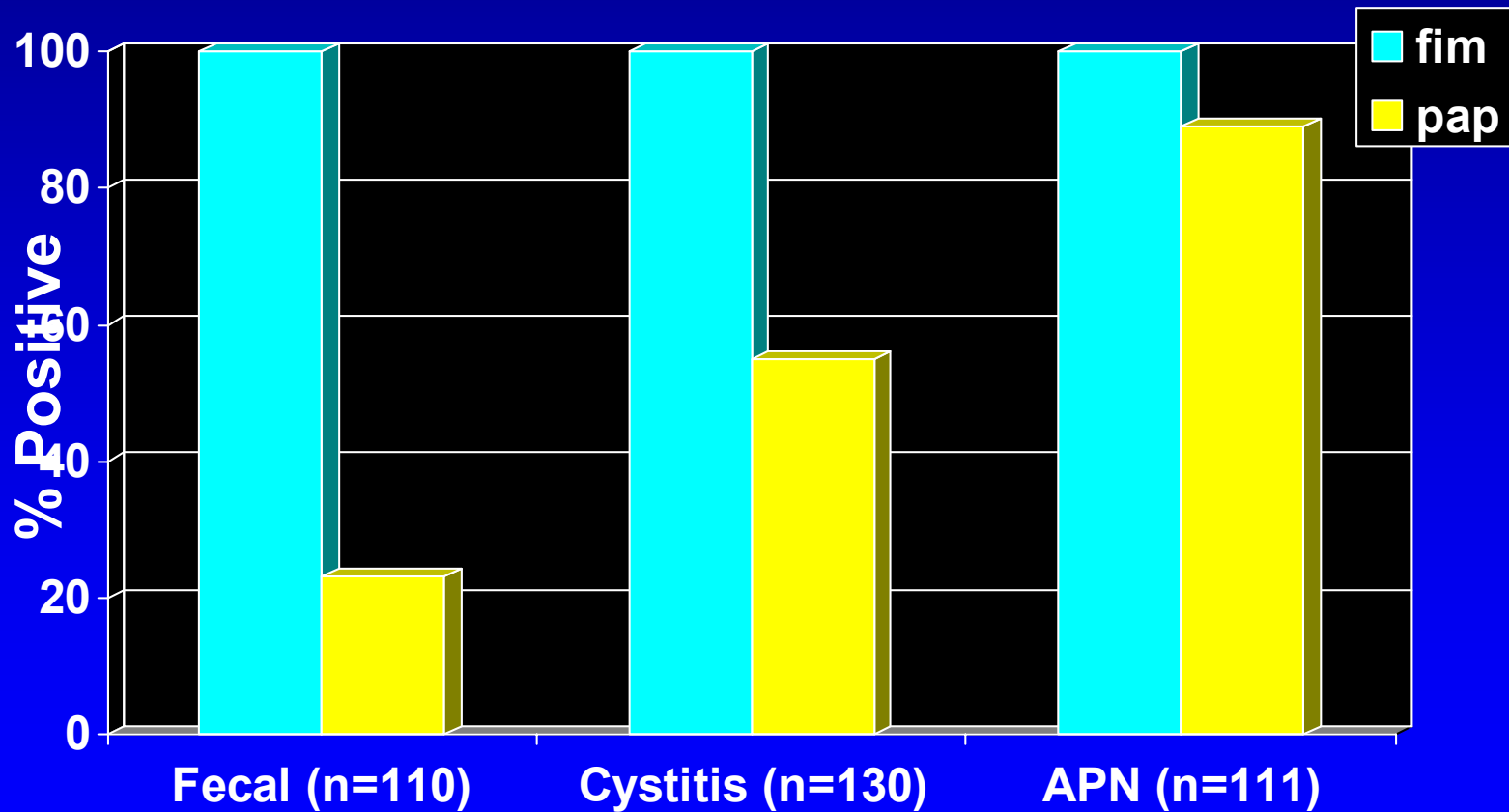


* Other factors interact

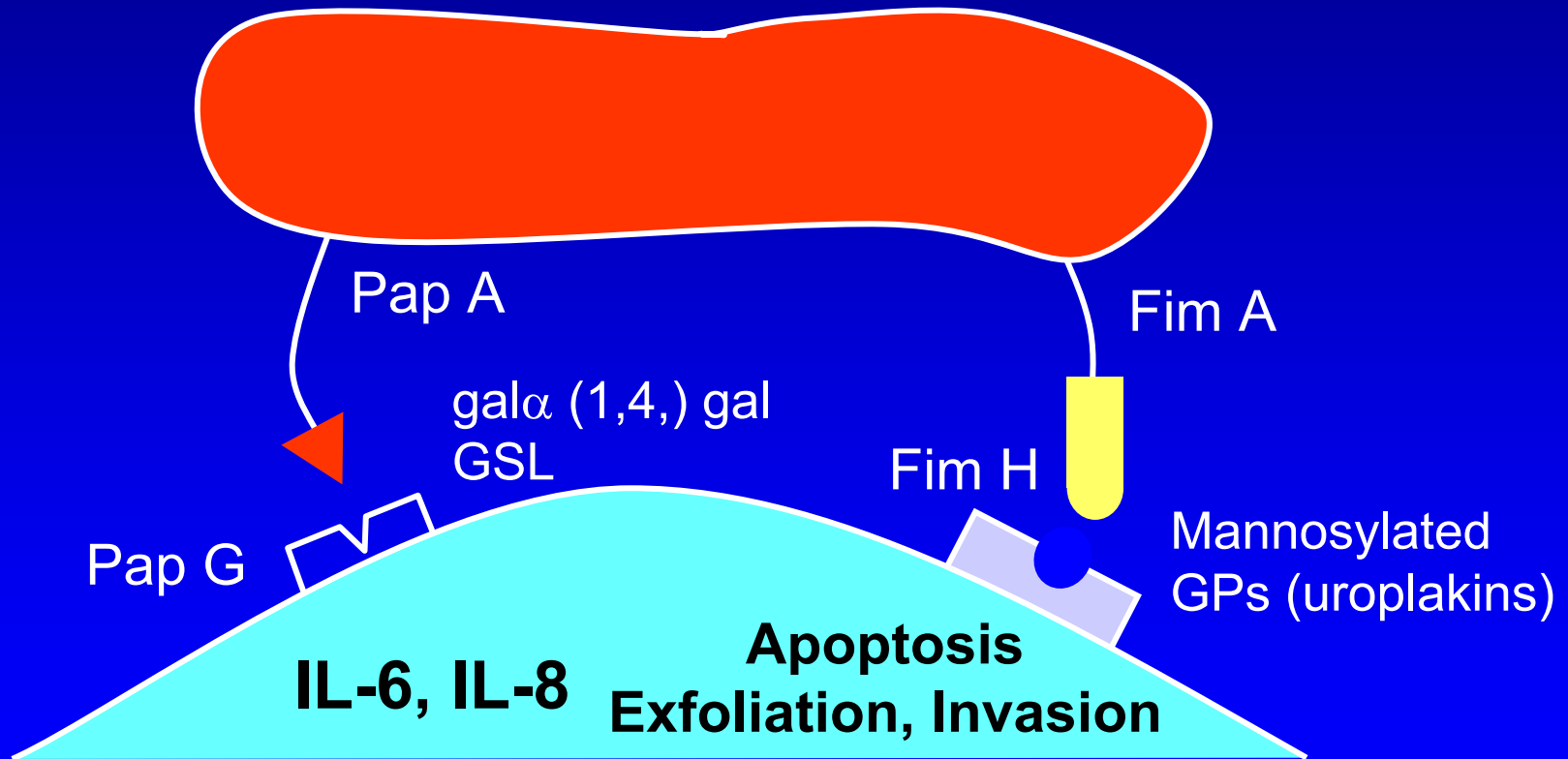
Uropathogenic *E. coli*

- Selected O, H, K clones
 - (O1:K1:H7, O4:K12:H7, etc.)
- Multiple genetic determinants
 - (pap, hly, cnf, aer)
 - (pathogenicity islands)
- Disease association (pap)
 - AUPN, sepsis 74-100%
 - Cystitis 50-60%
 - Fecal 10-30%
- Uncommon in complicated UTI

Fimbrial Type by Clinical Presentation



Interaction of *E. coli* with Uroepithelial Cells



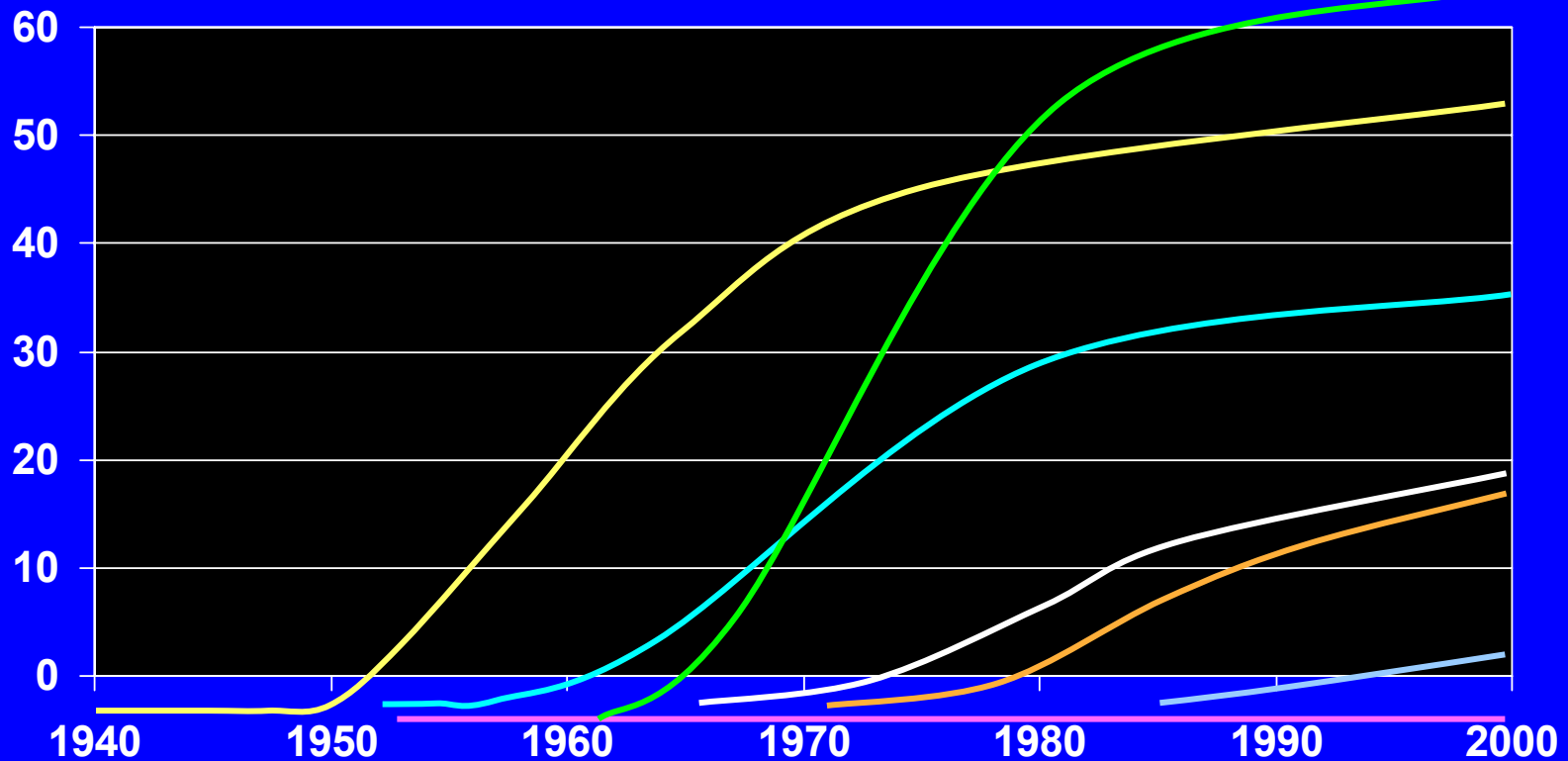
Clinical Severity/Manifestations of UTI in Diabetes

- Many infections proceed normally
- Severe outcomes in some
 - Pyelonephritis, urosepsis
 - Emphysematous cystitis/PN
 - Papillary necrosis, abscess
- Unusual pathogens
 - Klebsiella, other unusual GNR
 - Enterococci, GBS
 - Candida
- Relationship of ASB to UTI

Spectrum of UTI in DM

- Asymptomatic bacteriuria
- Acute cystitis
 - Emphysematous cystitis (> 90% DM)
- Acute pyelonephritis
 - Perinephric abscess (12-42% DM)
 - Papillary necrosis (50-60% DM)
 - Emphysematous PN (> 90% DM)
- Bacteremia (UTI source)

Evolution of ABR *E. coli* in UTI (Outpatient, Women)



↑
Sulfa

↗ ↑
Tetra Nitro

↑
Amp

↑
Cef

↑
TMP/SMX

↑
Cipro

