TABLE 1

pH_i and pH_e in normal and cancer cells: apoptosis and antiapoptosis

NORMAL CELLS ($pH_i<pH_e$)	CANCER CELLS ($pH_i>pH_e$) *("proton gradient reversal") (PGR)*
Intracellular pH (pH_i) 6.99-7.05	**Intracellular pH (pH_i) 7.2-7.8** *Pathological antiapoptosis*
Extracellular/interstitial pH (pH_e) 7.35-7.45	**Extracellular/interstitial pH (pH_e) 6.2-6.8** *Therapeutic apoptosis*

*For further details, see text and refs [9, 15].

TABLE 2

Factors that increase cell pH and/or stimulate NHE activity as mediators of high pHi-mediated carcinogenicity

Proton transporters (PTs) and proton pumps (PPs)
Virus (HPV E5, human polioma virus)
Oncogenes and viral proteins (v-mos, Ha-Ras, HPV16 E7)
Gene products (Bcl-2)
p53 deficiency
Genetic instability
Chemicals carcinogens (arsenic salts, benzo(a)pyrene)
Chronic hypoxia and HIF
Different mitogens
Hormones and cytokines (Insulin, growth hormone, prolactin, glucocorticoids, IGF-1, EGF, VEGF, PDGF, IL-1, IL-8, G-CSF, TGF-ß, Angiotensin II, PGE2, Bombesin, Diferric transferrin)
Glucose overload
Time (ageing)

***** Modified from Harguindey et al. [9]. For further details, see text.

TABLE 3

pHi, apoptosis and antiapoptosis in HNDDs and cancer

	HNDDs	Cancer
↑ **pHi**	Therapeutic antiapoptosis	Pathological antiapoptosis
↓ **pHi**	Pathological apoptosis	Therapeutic apoptosis