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Rnase A Post Mitotic Destabilisation of Nuclear Membrane in Testicular Cells.

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Abstract: RNase A is an endonuclease synthesised in pancreas and maintained inactive by inhibitor until required. So, treatment of testicular cells with RNAse lead to nuclear membrane destabilisation in germ cells through nucleoporin disassembly post mitotically as the synthesis is not affected. RNase A mainly affects the maturation of NPCs as the NPC seed formation is seen and immature NPCs are clearly visible.

I. INTRODUCTION:

Nucleoporins are the proteins associated with dynamic nature of the nuclear and cytoplasmic export and import and also acts as scaffold for the nuclear pore complex. Nucleoporins forms three distinct layers with transmembrane proteins interacting with nuclear membrane, cytoplasmic segments and central pore complex (Nup107- 160). The central pore interacts with nuclear lamina where as cytoplasmic segments does not play a role in nuclear transport. These proteins consist of phenylalanine and glycine repeats with which the transport proteins interact while the transport of the proteins larger than 40kd (1,2). The dynamic nature of nucleoporins is due to dynamic nature of nucleus but independently not. Nup153 is associated with the receptor mediated transport and inhibited when RNA polymerase is blocked (2). NuP50 acts as cofactor for importin mediated transport and NuP98 is associated with CRM1 mediated transport (2). Rnase 6 was already known for membrane destabilisation but RNase A causes Nuclear membrane destabilisation by preventing the Nucleoporin association to form nuclear pore complex.

II. RESULTS:

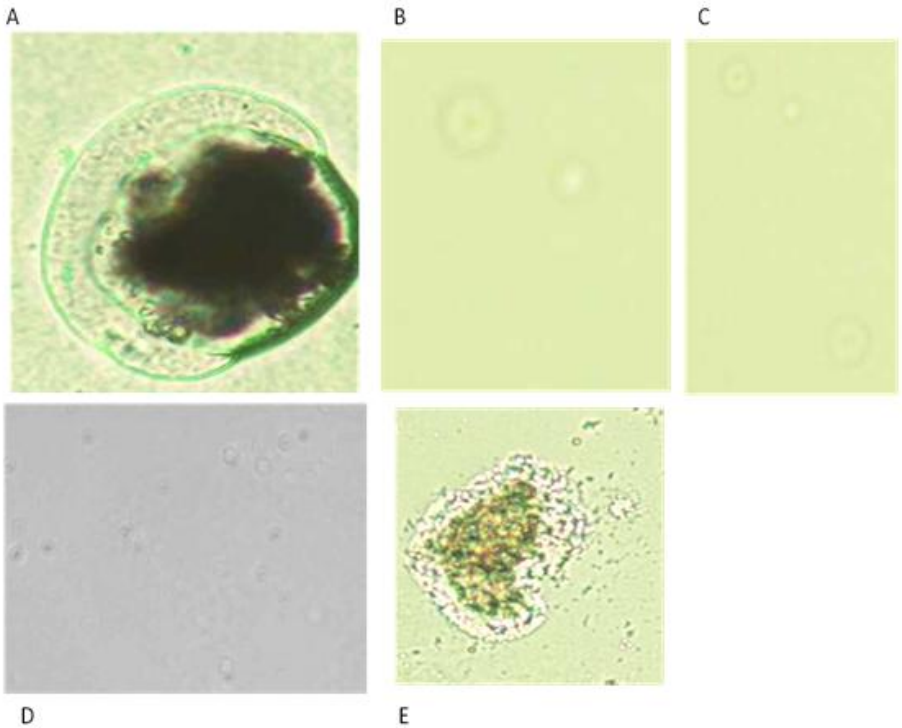

Figure :1 RNase A effect on nuclear organisation and Nuclear Pore complex formation. (A) shows the fusion ofouter and inner nuclear membranes. (b,c,d) shows the immature Nuclear pores where as E shows the NPC seeds deformation due to deficiency of POM 121.

Recent advances in scientific research proved to be RNase6 is involved in membrane destabilisation but RNase A has shown to affect membrane stabilisation by inhibiting nucleoporin maturation. From figure 1 b,c,d formation of immature NPC is clearly visible but conversion to mature NPC s is affected . Central ring is clearly visible but the rings connecting the central and peripheral NPC are not formed. The central NPCs include Nup 101-160, not affected by Rnase A but the NPC seed formation is also mainly affected by RNAse A which is clear from fig 1E. Fig 1A shows the fusion of nuclear membranes occurs during nuclear pore formation. Nuclear Pore complexes should be assembled and disassembled during cell division and should increase in number during interphase of cell cycle, so in this content the RNase A affects assembly of NPC post mitotically.

III. DISCUSSION:

Nucleoporins are the key integral proteins mainly involved in nuclear transport and also scaffolding of NPC complex. Karyopherins are the proteins involved in nuclear cargo transport that interact with FG repeats to transport proteins containing the localisation signal (3). Nuclear envelope mainly acts as barrier for the nuclear and cytosolic contents and NPC are responsible for the transport of mRNA in to cytosol after transcription (4,5). NPC vary in sequence and number among the species and dynamic nature of NPC is due to Nup153 in according to nucleus but not due to independent nature of Nup153(2). RNase A has previously known to cause Netosis in testicular cells but it can also affects NPC formation in testicular cells. So, mutations in gene encoding RI, Ribonulease inhibitor will have serious impact on the cell and also manipulation of RNase A in cancer cells will have serious impact on the germ cell stabilisation.

IV. CONCLUSION:

RNase A causes nuclear membrane destabilisation in germ cells through affecting the maturation of Nuclear pore complex by preventing the assembly of nucleoporins in to NPC after post mitotic division.

REFERENCES:

[1]. Kazuhiro Maeshima, Haruki Iino, Saera Hihara and Naoko Imamoto (2011). Nuclear size, nuclear pore number and cell cycleNucleus 2:2, 113-118.
[2]. Guillaume Chatel and Birthe Fahrenkrog (2012).Dynamics and diverse functions of nuclear pore complex proteins Nucleus. 2012 Mar 1; 3(2): 162–171.doi: 10.4161/nucl.19674.
[3]. Sarah walde and Ralph H. Kehlenbach (2010). The part and the whole: functions of nucleoporins in nucleocytoplasmic transport. Vol 20, issue , p461-469.
[4]. Allen NP, Patel SS, Huang L, Chalkley RJ, Burlingame A, Lutzmann M, Hurt EC, Rexach M (December 2002). "Deciphering networks of protein interactions at the nuclear pore complex". Molecular & Cellular Proteomics. 1 (12): 930–46.
[5]. Marfori M, Mynott A, Ellis JJ, Mehdi AM, Saunders NF, Curmi PM, Forwood JK, Bodén M, Kobe B (September 2011). "Molecular basis for specificity of nuclear import and prediction of nuclear localization". Biochimica et Biophysica Acta. 1813 (9): 1562–77.

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