

1 **Fig S1: Morphology of POAO**

2 (a) Bright field images of POAO. Scale bars = 10 μ m.

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4 **Fig S2: Localization of H3 post translational modifications in POYO and POAO**

5 (a) POYO and POAO stained for H3 histone modifications (green) and DNA (magenta). Scale
6 bars = 10 μ m.

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8 **Fig S3: Goat IVM and POAO death kinetics**

9 (a) Goat oocytes selection and in vitro maturation. (b) Quantification of IVM. (c) FDA (green)
10 staining of in vitro matured goat oocytes during ageing at 24, 48 and 76hrs. (d) Quantification
11 of goat in vitro matured aged oocyte death. (e) FDA (green) staining of in vitro matured goat
12 oocytes further incubated with or without NAC. (f) Quantification of % live POAO with or
13 without NAC at 48hrs. Error bars show mean \pm s.e.m (*) $P \leq 0.01$ unpaired *t*-tests. GV;
14 Germinal vehicle stage. MI; Metaphase I. MII; Metaphase II. Scale bars = 100 μ m.

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16 **Fig S4: Spindle quality in treatments**

17 (a) POAO with or without treatments stained for tubulin (green) and DNA (magenta). (b)
18 Quantification of different classes of spindles. Class I: Tight spindles; Class II: Loose or
19 circular spindles; Class III: No spindle staining. Error bars show mean \pm s.e.m. Dotted white
20 big circles are oocyte and the small circles are polar body. Scale bars = 10 μ m.

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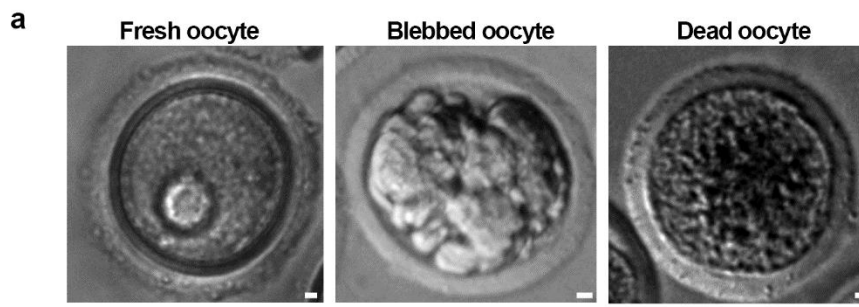
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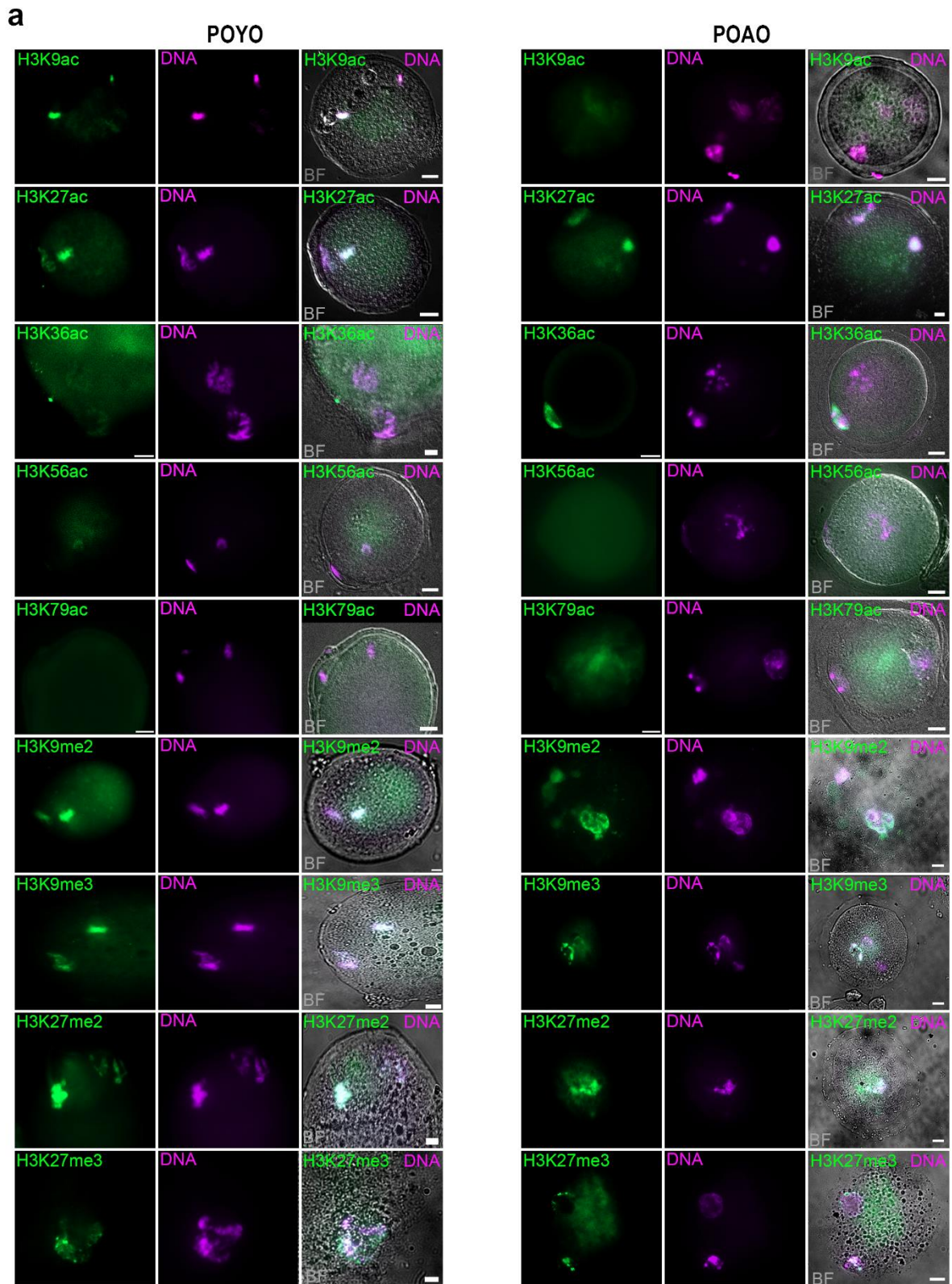
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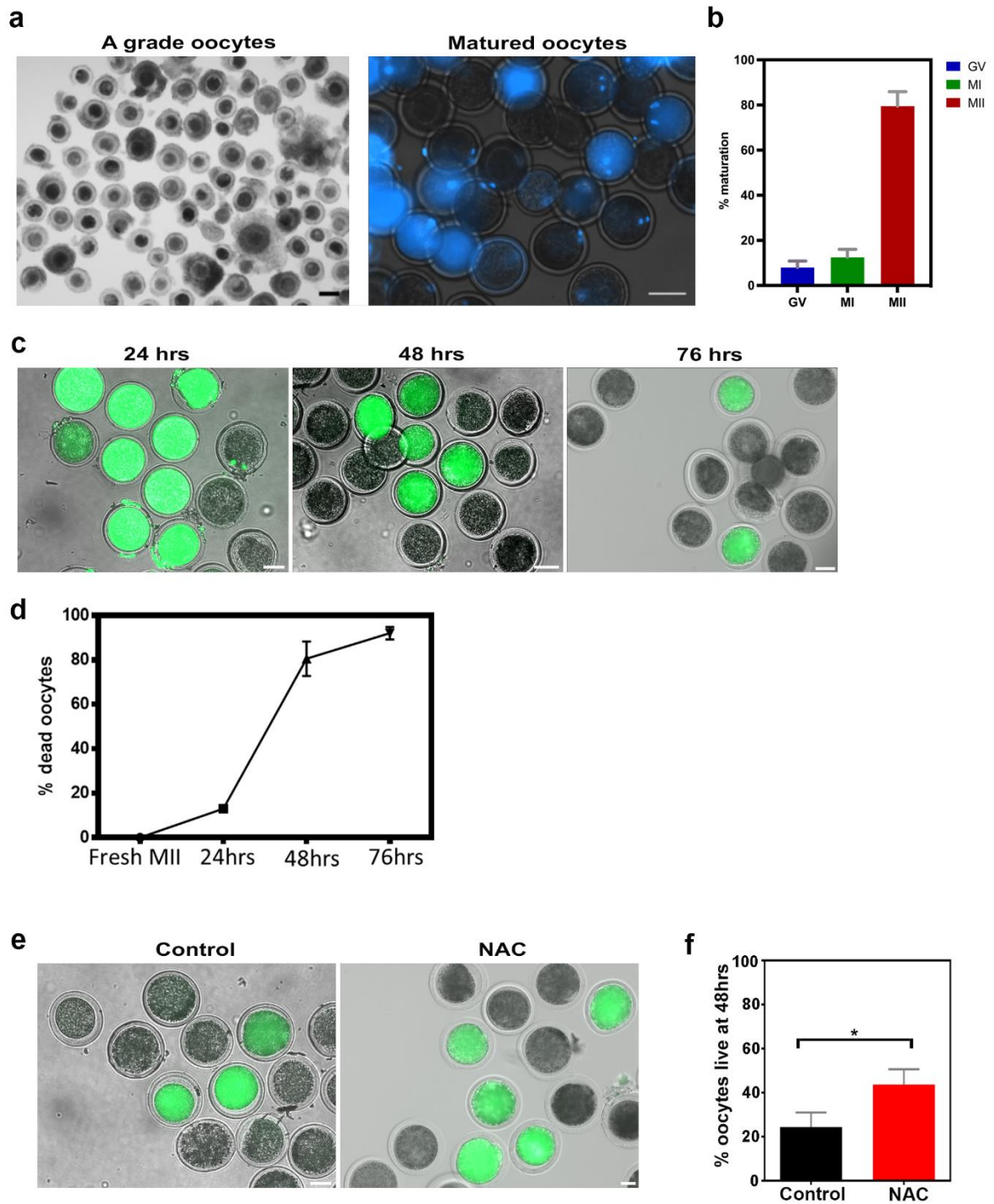
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33 Fig S1:



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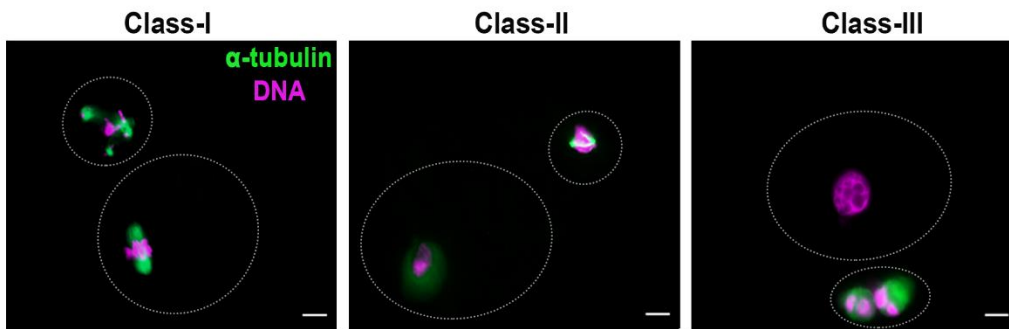




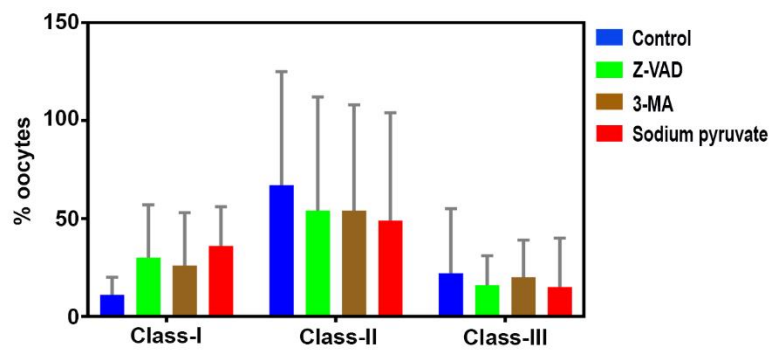
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44 Fig S4:

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