In search of new anticancer drugs: Data for cytotoxic activities of green synthesized silver nanoparticles from ethanolic extracts of fruits and leaves of *Annona muricata* and 5-Fluorouracil against HeLa, PC3 and PNT1A cell lines

Yahaya Gavamukulya\(^\text{a,b,*}\), Esther N. Maina\(^\text{a,c}\), Amos M. Meroka\(^\text{c,d}\), Hany A. El-Shemy\(^\text{a,e}\), Gabriel Magoma\(^\text{a}\), Fred Wamunyokoli\(^\text{a,f}\)

\(^\text{a}\) Department of Molecular Biology and Biotechnology, Pan African University Institute for Basic Sciences, Technology and Innovation (PAUSTI), P. O. Box, 62000-00200 Nairobi, Kenya
\(^\text{b}\) Department of Biochemistry and Molecular Biology, Faculty of Health Sciences, Busitema University, P.O. Box, 1460 Mbale, Uganda
\(^\text{c}\) Department of Biochemistry, College of Health Sciences, University of Nairobi, P.O. Box 30197-00100 Nairobi, Kenya
\(^\text{d}\) Department of Biochemistry, School of Medicine and Health Sciences, Kenya Methodist University, P.O. Box 267–60200 Meru, Kenya
\(^\text{e}\) Department of Biochemistry, Faculty of Agriculture, Cairo University, 12613 Giza, Egypt
\(^\text{f}\) Department of Biochemistry, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, P. O. Box, 62000-00200 Nairobi, Kenya

**ABSTRACT**

In this article, we present data on the anticancer activities of green synthesized silver nanoparticles (AgNPs) from ethanolic extracts of fruits (AgNPs-F) and leaves (AgNPs-L) of *Annona muricata* and standard anticancer drug 5-Fluorouracil (5-FU) on two cancer cell lines, i.e. cervical adenocarcinoma (HeLa cells) and prostate adenocarcinoma (PC3 cells) as well as on an immortalized normal prostate cell line, PNT1A. The cytotoxicity on the cells was determined by measuring the absorbance signal of resazurin dye. It has
long been known that metabolically active cells change the resazurin from blue (oxidized) to red (reduced) forms, corresponding to the absorbance signals at a wavelength of 570nm (A570) and 600nm (A600) respectively, from which therefore the effects of any treatments on percentage cell viability/death can be elucidated.

The raw data values of the treatments against the HeLa, PC3 and PNT1A cells are shown in the different Tables. Examples of how the data can be analyzed have been illustrated using different growth inhibition curves. The data can be used by academics, students, and researchers working on development of anticancer drugs.

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### 1. Data

The raw data of the treatments against the HeLa, PC3 and PNT1A cells are shown in the different Tables described in this section. Each experiment (Exp.) was represented by four independent replicates (Rep.). Tables 1–3 show the data for cytotoxicity of silver nanoparticles derived from fruits extracts of *Annona muricata* (AgNPs-F) on HeLa, PC3 and PNT1A cells; Tables 4–6 show the data for cytotoxicity of silver nanoparticles derived from leaves extracts of *Annona muricata* (AgNPs-L) on HeLa,
Table 1
Data for cytotoxicity of the AgNPs-F against HeLa Cells using the Resazurin metabolic assay.

| Concentration (μg/ml) | Replicates | Blank | 200 | 100 | 50 | 25 | 12.5 |
|----------------------|------------|-------|-----|-----|----|----|------|
| Exp. 1               |            |       |     |     |    |    |      |
| A570                 | Rep. 1     | 1.4698| 1.3135| 1.2295| 1.2667| 1.3932| 1.4757|
| Rep. 2               | 1.4291     | 0.9098| 1.2994| 1.2886| 1.3688| 1.4914|
| Rep. 3               | 1.5494     | 1.3617| 1.2275| 1.3184| 1.3802| 1.4947|
| Rep. 4               | 1.3866     | 0.8555| 1.3176| 1.2926| 1.3883| 1.5741|
| Mean Absorbance of Reps. | 1.45873 | 1.11763| 1.2685| 1.29158| 1.38263| 1.50897|
| A600                 | Rep. 1     | 0.775 | 1.1489| 1.0559| 1.0849| 0.8845| 0.646 |
| Rep. 2               | 0.8197     | 0.8186| 1.1004| 1.0854| 0.9019| 0.8163|
| Rep. 3               | 0.6554     | 1.1691| 1.0688| 1.1144| 0.8115| 0.6728|
| Rep. 4               | 0.7578     | 0.7987| 1.1132| 1.0988| 0.9122| 0.636 |
| Mean Absorbance of Reps. | 0.75197 | 0.98383| 1.08457| 1.09587| 0.87753| 0.69277|
| Net Absorbance (A570-A600) | 0.70676 | 0.1383| 0.18939| 0.19571| 0.5051| 0.8162|
| % Cell Viability     | 100        | 18.9315| 26.0244| 27.6911| 71.4670| 115 |
| Exp. 2               |            |       |     |     |    |    |      |
| A570                 | Rep. 1     | 1.5427| 1.2109| 0.9767| 1.3123| 1.323 | 1.444 |
| Rep. 2               | 1.5653     | 0.927 | 1.1317| 1.1178| 1.3343| 1.5014|
| Rep. 3               | 1.4661     | 1.2944| 1.2287| 1.4169| 1.3551| 1.4673|
| Rep. 4               | 1.4413     | 0.9868| 1.1181| 1.0673| 1.4321| 1.4468|
| Mean Absorbance of Reps. | 1.50385 | 1.10477| 1.1138| 1.22857| 1.36113| 1.46488|
| A600                 | Rep. 1     | 0.5542| 1.0557| 0.8384| 1.1167| 0.7809| 0.6737|
| Rep. 2               | 0.4877     | 0.8098| 0.961 | 0.9482| 0.8498| 0.5827|
| Rep. 3               | 0.4531     | 1.0748| 1.0026| 1.1551| 0.8375| 0.6709|
| Rep. 4               | 0.4348     | 0.8631| 0.9213| 0.8983| 0.7712| 0.7523|
| Mean Absorbance of Reps. | 0.48245 | 0.95085| 0.93082| 1.02958| 0.80985| 0.6699|
| Net Absorbance (A570-A600) | 1.0214 | 0.15392| 0.18298| 0.19899| 0.55125| 0.79498|
| % Cell Viability     | 100        | 15.0695| 17.9146| 19.4821| 53.9729| 77.8324 |
| Exp. 3               |            |       |     |     |    |    |      |
| A570                 | Rep. 1     | 1.446 | 1.313 | 1.2562| 1.2606| 1.4306| 1.4939|
| Rep. 2               | 1.4997     | 1.1884| 1.3107| 1.4239| 1.4366| 1.5769|
| Rep. 3               | 1.3913     | 1.1504| 1.2825| 1.534 | 1.4756| 1.5519|
| Rep. 4               | 1.3499     | 1.2011| 1.3006| 1.2713| 1.441 | 1.6484|
| Mean Absorbance of Reps. | 1.42172 | 1.21323| 1.2875| 1.37245| 1.44595| 1.56777|
| A600                 | Rep. 1     | 0.503 | 1.091 | 1.0543| 1.061 | 0.6198| 0.4778|
| Rep. 2               | 0.3938     | 0.9762| 1.0516| 1.1493| 0.7063| 0.5043|
| Rep. 3               | 0.3751     | 0.9297| 1.0299| 1.2124| 0.6676| 0.4227|
| Rep. 4               | 0.4032     | 0.9783| 1.0403| 1.027 | 0.778 | 0.5372|
| Mean Absorbance of Reps. | 0.41877 | 0.9938| 1.04402| 1.11242| 0.69292| 0.4855|
| Net Absorbance (A570-A600) | 1.00295 | 0.21943| 0.24348| 0.26003| 0.75303| 1.08227|
| % Cell Viability     | 100        | 21.8788| 24.2763| 25.9265| 75.0815| 108 |
| % Mean Cell Viability ± SD | 100 ± 0 | 18.6266 ± 3.40 | 22.7384 ± 4.27 | 24.3666 ± 4.32 | 66.8405 ± 11.29 | 100.2775 ± 19.75 |
PC3 and PNT1A cells; while Tables 7–9 show the data for cytotoxicity of 5FU on HeLa, PC3 and PNT1A cells. On the other hand, Figs. 1–3 show the growth inhibition curves for cells treated with AgNPs-F, Figs. 4–6 show growth inhibition curves of cells treated with AgNPs-L, while Figs. 7–9 show the growth inhibition curves for cells treated with 5FU.

1.1. Data for cytotoxicity of AgNPs-F on HeLa, PC3 and PNT1A cells

| Table 2 | Data for cytotoxicity of the AgNPs-F against PC3 Cells using the Resazurin metabolic assay. |
|-----------------|---------------------------------|
| Concentration (µg/ml) | Wavelength/nm | Replicates | 200 | 100 | 50 | 25 | 12.5 |
| Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 | Exp. 1 A570 |
| Rep. 1 | 1.3333 | 1.1585 | 1.0472 | 1.1885 | 1.2751 | 1.2804 |
| Rep. 2 | 1.2456 | 1.2892 | 1.1179 | 1.1709 | 1.2578 | 1.5277 |
| Rep. 3 | 1.2113 | 1.3057 | 1.0965 | 1.2815 | 1.3069 | 1.6487 |
| Rep. 4 | 1.1547 | 1.31 | 0.9138 | 1.1196 | 1.2775 | 1.6191 |
| Mean Absorbance of Reps. | 1.23623 | 1.26585 | 1.04385 | 1.19013 | 1.27933 | 1.51897 |
| A600 | Exp. 2 A570 | Exp. 2 A570 | Exp. 2 A570 | Exp. 2 A570 | Exp. 2 A570 | Exp. 2 A570 | Exp. 2 A570 |
| Rep. 1 | 0.8743 | 1.0464 | 1.0163 | 0.9057 | 0.9813 | 0.9847 |
| Rep. 2 | 0.7974 | 1.1854 | 0.8347 | 0.8893 | 0.9626 | 1.234 |
| Rep. 3 | 0.8159 | 1.2455 | 0.8202 | 0.9755 | 0.9999 | 1.3307 |
| Rep. 4 | 0.7762 | 1.2624 | 1.003 | 0.8564 | 0.9837 | 1.3069 |
| Mean Absorbance of Reps. | 0.81595 | 1.18492 | 0.91855 | 0.90673 | 0.98187 | 1.21408 |
| Net Absorbance (A570-A600) | 0.42028 | 0.08092 | 0.1253 | 0.2834 | 0.29745 | 0.3049 |
| % Cell Viability | 100 | 19.2552 | 29.8138 | 67.432 | 70.7751 | 72.5477 |
| Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 | Exp. 3 A570 |
| Rep. 1 | 1.1465 | 1.1826 | 1.2776 | 1.3187 | 1.4139 | 1.3651 |
| Rep. 2 | 1.1237 | 1.2939 | 1.2806 | 1.0512 | 1.374 | 1.6522 |
| Rep. 3 | 1.3081 | 1.2568 | 1.2649 | 1.401 | 1.3359 | 1.2984 |
| Rep. 4 | 1.053 | 1.228 | 1.111 | 1.2029 | 1.4066 | 1.7333 |
| Mean Absorbance of Reps. | 1.15782 | 1.24033 | 1.23352 | 1.24345 | 1.3826 | 1.51225 |
| A600 | Exp. 4 A570 | Exp. 4 A570 | Exp. 4 A570 | Exp. 4 A570 | Exp. 4 A570 | Exp. 4 A570 | Exp. 4 A570 |
| Rep. 1 | 0.54 | 1.0571 | 0.9571 | 1.1027 | 1.1306 | 1.0439 |
| Rep. 2 | 0.6766 | 1.2622 | 0.9634 | 1.0164 | 1.0716 | 1.3143 |
| Rep. 3 | 0.928 | 1.1568 | 1.0648 | 1.1281 | 1.0312 | 1.0449 |
| Rep. 4 | 0.7152 | 1.1127 | 1.0298 | 0.9907 | 1.0983 | 1.3841 |
| Mean Absorbance of Reps. | 0.71495 | 1.1472 | 1.00378 | 1.05948 | 1.08292 | 1.1968 |
| Net Absorbance (A570-A600) | 0.44287 | 0.09313 | 0.22975 | 0.18398 | 0.29967 | 0.31545 |
| % Cell Viability | 100 | 21.0274 | 51.8769 | 41.5411 | 67.6658 | 71.2278 |
| % Mean Cell Viability ± SD | 100 ± 13.8454 ± 10.94 | 41.6575 | 56.5795 ± 13.44 | 70.0054 ± 2.07 | 77.5716 ± 9.87 ±11.12 |
### Table 3
Data for cytotoxicity of the AgNPs-F against PNT1A normal cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/Replicates Blank | 200 | 100 | 50 | 25 | 12.5 |
|----------------------|-----------------------------|-----|-----|----|----|------|
|                      | A570                        |     |     |    |    |      |
| Exp. 1               | Rep. 1                      | 1.0662 | 1.322 | 1.1746 | 1.3105 | 0.9654 | 1.0308 |
|                      | Rep. 2                      | 1.0252 | 1.2622 | 1.1472 | 1.1819 | 1.1266 | 1.146 |
|                      | Rep. 3                      | 1.0735 | 1.5141 | 1.1129 | 1.0966 | 1.2235 | 2.0434 |
|                      | Rep. 4                      | 1.0679 | 1.4703 | 1.0964 | 1.2052 | 1.2261 | 1.1985 |
| Mean Absorbance of Reps. | A570                      | 1.0582 | 1.39215 | 1.13278 | 1.19855 | 1.1354 | 1.35468 |
|                      | A600                        |     |     |    |    |      |
| Exp. 1               | Rep. 1                      | 0.4355 | 0.9898 | 0.7002 | 0.6334 | 0.775 | 0.669 |
|                      | Rep. 2                      | 0.5535 | 0.9617 | 0.7756 | 0.733 | 0.9649 | 0.5 |
|                      | Rep. 3                      | 0.507 | 1.1626 | 0.7718 | 0.6998 | 1.1027 | 1.3381 |
|                      | Rep. 4                      | 0.5895 | 1.1143 | 0.9109 | 0.8611 | 1.0304 | 0.8164 |
| Mean Absorbance of Reps. | A570                      | 0.52138 | 1.0571 | 0.78963 | 0.73183 | 0.96825 | 0.83087 |
|                      | A600                        |     |     |    |    |      |
| Exp. 2               | Rep. 1                      | 1.0403 | 1.0461 | 1.108 | 1.1146 | 1.0012 | 1.053 |
|                      | Rep. 2                      | 1.0948 | 1.2727 | 1.0925 | 1.105 | 1.178 | 1.1035 |
|                      | Rep. 3                      | 1.0239 | 1.1515 | 1.0847 | 1.1341 | 1.2848 | 1.1462 |
|                      | Rep. 4                      | 1.0595 | 1.3475 | 1.0336 | 1.0617 | 1.2899 | 1.0691 |
| Mean Absorbance of Reps. | A570                      | 1.05463 | 1.20445 | 1.0797 | 1.10385 | 1.18847 | 1.09295 |
|                      | A600                        |     |     |    |    |      |
| Exp. 3               | Rep. 1                      | 0.6439 | 0.8089 | 0.6201 | 0.6013 | 0.7937 | 0.483 |
|                      | Rep. 2                      | 0.456 | 0.9612 | 0.8254 | 0.7689 | 0.9855 | 0.5061 |
|                      | Rep. 3                      | 0.6273 | 0.8999 | 0.6621 | 0.8289 | 1.1305 | 0.6187 |
|                      | Rep. 4                      | 0.4868 | 1.0054 | 0.7801 | 0.8518 | 1.0603 | 0.8104 |
| Mean Absorbance of Reps. | A570                      | 0.5535 | 0.91885 | 0.72193 | 0.76272 | 0.9925 | 0.60455 |
|                      | A600                        |     |     |    |    |      |
| Exp. 2               | Rep. 1                      | 1.4067 | 1.4349 | 1.1762 | 1.2242 | 1.7042 | 1.2268 |
|                      | Rep. 2                      | 1.3437 | 1.3423 | 1.2115 | 1.2436 | 1.6892 | 1.3645 |
|                      | Rep. 3                      | 1.1885 | 1.3744 | 1.1532 | 1.2279 | 1.5748 | 1.3597 |
|                      | Rep. 4                      | 1.3056 | 1.3265 | 1.1547 | 1.3041 | 1.7545 | 1.3102 |
| Mean Absorbance of Reps. | A570                      | 1.31113 | 1.36953 | 1.1739 | 1.24995 | 1.68068 | 1.3153 |
|                      | A600                        |     |     |    |    |      |
| Exp. 3               | Rep. 1                      | 0.8095 | 1.128 | 0.8524 | 0.8504 | 0.7139 | 0.9781 |
|                      | Rep. 2                      | 0.5971 | 1.0511 | 0.7117 | 0.7322 | 0.6383 | 0.7012 |
|                      | Rep. 3                      | 0.5568 | 1.0699 | 0.8382 | 0.9259 | 0.7067 | 0.6284 |
|                      | Rep. 4                      | 0.6509 | 1.0417 | 0.7584 | 0.9122 | 0.6807 | 0.7825 |
| Mean Absorbance of Reps. | A570                      | 0.65358 | 1.07268 | 0.79018 | 0.85517 | 0.6849 | 0.77255 |
|                      | A600                        |     |     |    |    |      |
| % Cell Viability     | A570                        | 100 | 62.4133 | 63.9221 | 86.9417 | 56.9918 | 97.5737 |
|                      | A600                        | 100 | 56.9918 | 71.3944 | 68.0718 | 39.107 | 97.4607 |
| % Mean Cell Viability ± SD | A570                 | 100 | 54.85 | 64.5578 | 64.5578 ± 6.54 | 71.6836 ± 13.81 | 73.8936 ± 67.27 | 92.5252 ± 8.65
1.2. Data for cytotoxicity of AgNPs-L on HeLa, PC3 and PNT1A cells

Table 4
Data for cytotoxicity of the AgNPs-L against HeLa Cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/nm | Replicates | Blank | 200 | 100 | 50 | 25 | 12.5 |
|-----------------------|-------------|------------|-------|-----|-----|----|----|------|
| **Exp. 1** A570       |             |            |       |     |     |    |    |      |
| Rep. 1                | 0.9300      | 0.8548     | 1.0364| 0.9733 | 0.9654 | 0.9224 |
| Rep. 2                | 1.3646      | 1.0182     | 1.2764| 0.9654 | 1.1266 | 1.1541 |
| Rep. 3                | 1.2094      | 1.3914     | 1.3338| 1.2985 | 1.2235 | 1.1968 |
| Rep. 4                | 1.3059      | 1.1796     | 1.2899| 1.1952 | 1.2261 | 1.2324 |
| Mean Absorbance of Reps. A570 | 1.20247 | 1.111 | 1.23412 | 1.10835 | 1.1354 | 1.12624 |
| Rep. 1                | 0.6142      | 0.8395     | 0.8456| 0.7411 | 0.775 | 0.5721 |
| Rep. 2                | 0.9294      | 0.9751     | 1.0388| 0.6971 | 0.9649 | 0.6962 |
| Rep. 3                | 1.0003      | 1.4323     | 1.0919| 1.1155 | 1.1027 | 0.9274 |
| Rep. 4                | 0.8611      | 1.1857     | 1.0725| 0.9207 | 1.0304 | 0.9128 |
| Mean Absorbance of Reps. A570- A600 | 0.85125 | 1.10815 | 1.0122 | 0.8686 | 0.96825 | 0.77713 |
| Net Absorbance (A570- A600) | 0.35122 | 0.02685 | 0.22975 | 0.16715 | 0.3493 |
| % Cell Viability      |             |            |       |     |     |    |    |      |
| Exp. 2 A570           |             |            |       |     |     |    |    |      |
| Rep. 1                | 0.9551      | 0.8854     | 1.0429| 1.0087 | 1.0012 | 0.9341 |
| Rep. 2                | 1.4089      | 1.0653     | 1.2939| 1.106 | 1.178 | 1.1937 |
| Rep. 3                | 1.2444      | 1.4537     | 1.362 | 1.3543 | 1.2848 | 1.2442 |
| Rep. 4                | 1.3292      | 1.2382     | 1.3149| 1.2499 | 1.2899 | 1.264 |
| Mean Absorbance of Reps. A570- A600 | 1.2344 | 1.16065 | 1.25343 | 1.15473 | 1.18847 | 1.159 |
| Rep. 1                | 0.6179      | 0.8533     | 0.8723| 0.7601 | 0.7937 | 0.5722 |
| Rep. 2                | 0.9504      | 0.9494     | 1.0855| 0.7129 | 0.9855 | 0.712 |
| Rep. 3                | 1.0168      | 1.4649     | 1.1522| 1.1398 | 1.1305 | 0.9507 |
| Rep. 4                | 0.8705      | 1.2156     | 1.1315| 0.945 | 1.0603 | 0.9185 |
| Mean Absorbance of Reps. A570- A600 | 0.8639 | 1.13215 | 1.06038 | 0.88945 | 0.9925 | 0.78335 |
| Net Absorbance (A570- A600) | 0.3705 | 0.0285 | 0.19305 | 0.26528 | 0.19598 | 0.37065 |
| % Cell Viability      |             |            |       |     |     |    |    |      |
| Exp. 3 A570           |             |            |       |     |     |    |    |      |
| Rep. 1                | 1.618       | 1.4486     | 1.4134| 1.4438 | 1.7042 | 1.5772 |
| Rep. 2                | 1.6132      | 1.3799     | 1.3523| 1.3666 | 1.6892 | 1.5764 |
| Rep. 3                | 1.5871      | 1.3893     | 1.349 | 1.3177 | 1.5748 | 1.4538 |
| Rep. 4                | 2.2674      | 1.3500     | 1.3508| 1.5011 | 1.7545 | 1.4657 |
| Mean Absorbance of Reps. A570- A600 | 1.77143 | 1.39195 | 1.36655 | 1.4073 | 1.68068 | 1.51828 |
| Rep. 1                | 0.7961      | 1.0479     | 1.2882| 1.1222 | 0.7139 | 0.7698 |
| Rep. 2                | 0.8412      | 1.0662     | 1.1998| 1.0908 | 0.6383 | 0.8527 |
| Rep. 3                | 0.8130      | 0.9942     | 1.1778| 1.1227 | 0.7067 | 0.8380 |
| Rep. 4                | 1.0122      | 0.9290     | 1.1759| 0.9830 | 0.6807 | 0.9100 |
| Mean Absorbance of Reps. A570- A600 | 0.86563 | 1.00932 | 1.20793 | 1.07968 | 0.6849 | 0.84263 |
| Net Absorbance (A570- A600) | 0.9058 | 0.32863 | 0.15863 | 0.32762 | 0.99578 | 0.67565 |
| % Cell Viability      |             |            |       |     |     |    |    |      |
| % Mean Cell Viability ± SD | 100 ± 0      | 42.2417 | 17.5121 | 36.1697 | 109.933 | 74.5915 |

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### Table 5
Data for cytotoxicity of the AgNPs-L against PC3 Cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/nm | Replicates | Blank | 200 | 100 | 50 | 25 | 12.5 |
|----------------------|----------------|------------|-------|-----|-----|----|----|------|
|                       | A570           | Exp. 1      |       |     |     |    |    |      |
|                       | Rep. 1         | 1.0656      | 1.0033| 0.8548| 1.0472| 1.1885| 1.2751|
|                       | Rep. 2         | 1.0504      | 0.8598| 1.0182| 1.1179| 1.1709| 1.2578|
|                       | Rep. 3         | 0.9836      | 1.1382| 1.3914| 1.0965| 1.2815| 1.3069|
|                       | Rep. 4         | 0.9948      | 0.9712| 1.1796| 0.9138| 1.1196| 1.2775|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | A570           | Exp. 1      |       |     |     |    |    |      |
|                       | Rep. 1         | 1.0236      | 0.9912| 1.111| 1.04385| 1.19013| 1.27933|
|                       | Rep. 2         | 0.6045      | 1.0854| 0.8395| 1.0163| 0.9057| 0.9813|
|                       | Rep. 3         | 0.6152      | 0.8481| 0.9751| 0.8347| 0.8893| 0.9626|
|                       | Rep. 4         | 0.6472      | 1.1427| 1.4323| 0.8202| 0.9755| 0.9999|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | A600           | Exp. 1      |       |     |     |    |    |      |
|                       | Rep. 1         | 0.6218      | 1.0194| 1.1857| 1.003| 0.8564| 0.9837|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | % Cell Viability| 100         | −7.6664| 0.70997| 31.2138| 70.5985| 74.0985|
|                       | Net Absorbance (A570-A600) | 0.40143 | −0.0307| 0.00285| 0.1253| 0.2834| 0.29745|
|                       | % Cell Viability| 100         | −7.6664| 0.70997| 31.2138| 70.5985| 74.0985|
|                       | Exp. 2         | A570        |       |     |     |    |    |      |
|                       | Rep. 1         | 0.9578      | 0.9334| 0.8854| 1.0416| 1.1698| 1.2876|
|                       | Rep. 2         | 1.1571      | 1.0754| 1.0653| 1.1424| 1.1884| 1.344|
|                       | Rep. 3         | 1.1137      | 1.0846| 1.4537| 1.8403| 1.1754| 1.2491|
|                       | Rep. 4         | 1.0617      | 0.9629| 1.2382| 1.0647| 1.2895| 1.34|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | A600           | Exp. 1      |       |     |     |    |    |      |
|                       | Rep. 1         | 0.5302      | 0.9295| 0.8533| 0.7479| 0.9004| 0.9852|
|                       | Rep. 2         | 0.8297      | 0.8506| 0.9948| 0.8102| 0.9322| 1.0424|
|                       | Rep. 3         | 0.764       | 1.1326| 1.4649| 1.7465| 0.9557| 0.9652|
|                       | Rep. 4         | 0.83        | 0.9381| 1.2156| 1.0593| 1.0168| 1.0288|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | % Cell Viability| 100         | 0.9334| 0.8854| 1.0416| 1.1698| 1.2876|
|                       | Net Absorbance (A570-A600) | 0.40143 | −0.0307| 0.00285| 0.1253| 0.2834| 0.29745|
|                       | % Cell Viability| 100         | 0.9334| 0.8854| 1.0416| 1.1698| 1.2876|
|                       | Exp. 3         | A570        |       |     |     |    |    |      |
|                       | Rep. 1         | 1.323       | 1.132| 1.4486| 1.2776| 1.3187| 1.4139|
|                       | Rep. 2         | 1.2966      | 1.2185| 1.3799| 1.2806| 1.0512| 1.374|
|                       | Rep. 3         | 1.2871      | 1.1995| 1.3893| 1.2649| 1.401| 1.3359|
|                       | Rep. 4         | 1.209       | 1.1804| 1.35 | 1.111| 1.2029| 1.4066|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | A600           | Exp. 1      |       |     |     |    |    |      |
|                       | Rep. 1         | 1.2041      | 1.0888| 1.0479| 0.9571| 1.1027| 1.1306|
|                       | Rep. 2         | 0.9343      | 1.0871| 1.0662| 0.9634| 1.0164| 1.0716|
|                       | Rep. 3         | 0.9466      | 1.1122| 0.9942| 1.0648| 1.1281| 1.0312|
|                       | Rep. 4         | 1.0884      | 1.2177| 0.929 | 1.0298| 0.9907| 1.0083|
| Mean Absorbance of Reps.|               |             |       |     |     |    |    |      |
|                       | % Cell Viability| 100         | 20.0125| 136.372| 81.8854| 65.5707| 106.807|
|                       | % Mean Cell Viability ± SD | 100 ± 0     | 9.24106| 48.5374 ± 76.16| 55.7856 ± 25.37| 70.7813 ± 5.3| 90.2107 ± 16.36|
Table 6  
Data for cytotoxicity of the AgNPs-L against PNT1A normal cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/nm | Replicates | Blank | 200 | 100 | 50 | 25 | 12.5 |
|-----------------------|---------------|------------|-------|-----|-----|----|----|-----|
|                       |               | Exp. 1     |       |     |     |    |    |     |
| A570                  |               | Rep. 1     | 1.2407| 1.0866| 1.2406| 1.3137| 1.2693| 0.9282|
|                       |               | Rep. 2     | 1.1232| 0.8972| 1.28  | 1.2804| 1.2856| 0.9183|
|                       |               | Rep. 3     | 1.269 | 1.5388| 1.1828| 1.2567| 1.069 | 0.9439|
|                       |               | Rep. 4     | 1.2601| 1.2797| 1.2009| 1.303 | 1.235 | 0.8617|
| Mean Absorbance of Reps |               | A570       |       |     |     |    |    |     |
|                       |               | Rep. 1     | 1.22325| 1.20057| 1.22607| 1.28845| 1.21472| 0.91302|
|                       |               | Rep. 2     | 1.07743| 0.746 | 0.9653| 1.0537| 0.9954| 0.4771|
|                       |               | Rep. 3     | 0.6654 | 0.9776| 1.0465| 1.0191| 1.0113| 1.0198|
|                       |               | Rep. 4     | 0.7117 | 0.95  | 0.9685| 1.0086| 0.8496| 0.7099|
| Mean Absorbance of Reps |               | A600       |       |     |     |    |    |     |
|                       |               | Rep. 1     | 0.77405| 0.9272| 0.98192| 1.03277| 0.96295| 0.8244|
|                       |               | Rep. 2     | 0.4492 | 0.27338| 0.24415| 0.25568| 0.25177| 0.08862|
| Mean Absorbance of Reps |               | A570–A600  |       |     |     |    |    |     |
|                       |               | Rep. 1     | 0.77405| 0.9272| 0.98192| 1.03277| 0.96295| 0.8244|
|                       |               | Rep. 2     | 0.4492 | 0.27338| 0.24415| 0.25568| 0.25177| 0.08862|
| % Cell Viability      |               | Exp. 2     |       |     |     |    |    |     |
|                       |               | Rep. 1     | 1.1515 | 1.1619| 1.1257| 1.1935| 1.1548| 0.9842|
|                       |               | Rep. 2     | 1.211  | 1.3064| 1.2002| 1.1932| 1.1526| 1.3729|
|                       |               | Rep. 3     | 1.0892 | 1.382 | 1.4051| 1.2978| 1.2415| 1.2624|
|                       |               | Rep. 4     | 1.2657 | 1.1699| 1.1682| 1.3704| 1.2996| 1.2985|
| Mean Absorbance of Reps |               | A600       |       |     |     |    |    |     |
|                       |               | Rep. 1     | 1.17935| 1.25505| 1.2248| 1.26372| 1.21213| 1.2295|
|                       |               | Rep. 2     | 0.5864 | 0.9968| 0.8734| 0.9459| 0.9092| 0.4771|
|                       |               | Rep. 3     | 0.7193 | 0.9433| 0.9986| 0.9383| 0.8934| 1.0198|
|                       |               | Rep. 4     | 0.71   | 1.2182| 1.1052| 1.0181| 0.9764| 0.7099|
| Mean Absorbance of Reps |               | A570–A600  |       |     |     |    |    |     |
|                       |               | Rep. 1     | 0.7068 | 1.09552| 0.9797| 1.00005| 0.94633| 0.8244|
|                       |               | Rep. 2     | 0.47255| 0.15952| 0.2451| 0.26367| 0.2658| 0.4051|
| % Cell Viability      |               | Exp. 3     |       |     |     |    |    |     |
|                       |               | Rep. 1     | 1.1275 | 1.035 | 1.2563| 1.3947| 1.2913| 1.1149|
|                       |               | Rep. 2     | 1.2802 | 1.156 | 1.1997| 1.4059| 1.3251| 1.246 |
|                       |               | Rep. 3     | 1.2155 | 1.1991| 1.2531| 1.0914| 1.3846| 1.2462|
|                       |               | Rep. 4     | 1.2674 | 1.2178| 1.2982| 1.4632| 1.3368| 1.2599|
| Mean Absorbance of Reps |               | A600       |       |     |     |    |    |     |
|                       |               | Rep. 1     | 1.22265| 1.15198| 1.25183| 1.3388| 1.33445| 1.21675|
|                       |               | Rep. 2     | 0.8274 | 0.746 | 0.9999| 1.1287| 1.0471| 0.9102|
|                       |               | Rep. 3     | 0.6811 | 0.9776| 0.979 | 1.1563| 1.0674| 0.623 |
|                       |               | Rep. 4     | 0.7668 | 1.0352| 1.0329| 1.1917| 1.0738| 0.9023|
| Mean Absorbance of Reps |               | A570–A600  |       |     |     |    |    |     |
|                       |               | Rep. 1     | 0.73725| 0.9272| 1.0124| 1.09232| 1.07155| 0.84018|
|                       |               | Rep. 2     | 0.4854 | 0.22478| 0.23943| 0.24648| 0.2629| 0.37657|
| % Cell Viability      |               | % Mean Cell Viability ± SDs | 100 ± 0 | 46.9746 ± 13.56 | 51.8483 ± 2.51 | 54.498 ± 3.23 | 55.4864 ± 1.15 | 61.0121 ± 35.98 |
1.3. Data for cytotoxicity of 5FU on HeLa, PC3 and PNT1A cells

Table 7
Data for cytotoxicity of 5FU against HeLa Cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/Replicates | Blank  | 200   | 100   | 50    | 25    | 12.5  |
|-----------------------|-----------------------|--------|-------|-------|-------|-------|-------|
|                       |                       |        |       |       |       |       |       |
| Exp. 1 A570           | Rep. 1                | 0.9300 | 0.9917| 1.2199| 0.8006| 1.0193| 1.0169|
|                       | Rep. 2                | 1.3646 | 1.186 | 1.2638| 1.1729| 1.1181| 1.207 |
|                       | Rep. 3                | 1.2094 | 1.0287| 1.1894| 1.1752| 1.0646| 1.1992|
|                       | Rep. 4                | 1.3059 | 1.171 | 1.1563| 1.0809| 1.1307| 1.1797|
| Mean Absorbance of     |                      | 1.20247| 1.09435| 1.20735| 1.0574| 1.08318| 1.1507|
| Exp. 2 A570           | Rep. 1                | 0.6142 | 0.8624| 1.127 | 0.699 | 0.9253| 0.8917|
|                       | Rep. 2                | 0.9294 | 1.1043| 1.1901| 1.0642| 1.074 | 1.1148|
|                       | Rep. 3                | 1.0003 | 1.0022| 1.1349| 1.1609| 1.0259| 1.0741|
|                       | Rep. 4                | 0.8611 | 1.144 | 1.102 | 1.0754| 1.0492| 1.1133|
| Mean Absorbance of     |                      | 0.85125| 1.02823| 1.1385 | 0.99988| 1.0186| 1.04847|
| Net Absorbance (A570- | Reps. 1               | 0.35122| 0.06612| 0.06885| 0.05752| 0.06457| 0.10223|
| A600)                 | Reps. 2               |        |       |       |       |       |       |
|                       | Reps. 3               |        |       |       |       |       |       |
|                       | Reps. 4               |        |       |       |       |       |       |
| % Cell Viability       |                      | 100    | 18.827| 19.6028| 16.3784| 18.3856| 29.1053|
| Exp. 3 A570           | Rep. 1                | 0.6179 | 0.8865| 1.1511| 0.7214| 0.9486| 0.9195|
|                       | Rep. 2                | 0.9504 | 1.1268| 1.2173| 1.0868| 1.0954| 1.1367|
|                       | Rep. 3                | 1.0168 | 1.0383| 1.1735| 1.2021| 1.0573| 1.1011|
|                       | Rep. 4                | 0.8705 | 1.1749| 1.1333| 1.1027| 1.0712| 1.1387|
| Mean Absorbance of     |                      | 0.8639 | 1.05663| 1.1688 | 1.02825| 1.04312| 1.074|
| Net Absorbance (A570- | Reps. 1               | 0.3705 | 0.08075| 0.08948| 0.076 | 0.08072| 0.12515|
| A600)                 | Reps. 2               |        |       |       |       |       |       |
|                       | Reps. 3               |        |       |       |       |       |       |
|                       | Reps. 4               |        |       |       |       |       |       |
| % Cell Viability       |                      | 100    | 21.7949| 24.1498| 20.5128| 21.7881| 33.7787|
| Mean % Cell Viability ±SD |               | 100 ± 0| 26.2163 ± 10.33| 28.4541 ± 11.62| 29.811 ± 19.79| 33.3975 ± 23.11| 41.3751 ± 17.36|
| Concentration (µg/ml) | Wavelength/nm | Replicates | Blank | 200 | 50 | 25 | 12.5 |
|----------------------|---------------|------------|-------|-----|----|----|-----|
| Exp. 1               | A570          | Rep. 1     | 1.3333| 1.2295| 1.4598 | 1.3509 | 1.5099 | 1.3809 |
|                      |               | Rep. 2     | 1.2456| 1.2565| 1.3126 | 1.2195 | 1.3586 | 1.259 |
|                      |               | Rep. 3     | 1.2113| 1.2528| 1.4194 | 1.2509 | 1.454 | 1.277 |
|                      |               | Rep. 4     | 1.1547| 1.219 | 1.3856 | 1.2766 | 1.3622 | 1.2752 |
| Mean Absorbance of Reps. | A570          | Rep. 1     | 1.23623| 1.23945| 1.39435 | 1.27448 | 1.42118 | 1.29802 |
|                      |               | Rep. 2     | 0.8743| 1.1243| 1.3535 | 1.0984 | 1.3006 | 1.1187 |
|                      |               | Rep. 3     | 0.7974| 1.058 | 1.1941 | 1.0904 | 1.1127 | 0.9825 |
|                      |               | Rep. 4     | 0.8159| 1.101 | 0.969 | 0.9938 | 1.2125 | 1.0203 |
| Mean Absorbance of Reps. | A600          | Rep. 1     | 0.81595| 1.08527| 1.1536 | 1.06572 | 1.18677 | 1.04928 |
|                      |               | Rep. 2     | 0.7762| 1.0578 | 1.0978 | 1.0803 | 1.1213 | 1.0756 |
|                      |               | Rep. 3     | 0.15418| 0.20475| 0.24075 | 0.20875 | 0.2344 | 0.24875 |
|                      |               | Rep. 4     | 0.11752| 1.0659 | 1.0555 | 1.1281 | 1.1668 | 1.1998 |
| Mean % Cell Viability | A570          | Rep. 1     | 1.1529| 1.1256| 1.0922 | 1.189 | 1.1088 | 1.2155 |
|                      |               | Rep. 2     | 1.302| 1.0736 | 2.0665 | 1.1893 | 1.2698 | 1.1701 |
|                      |               | Rep. 3     | 1.2233| 1.0479 | 1.2537 | 1.1769 | 1.2981 | 1.1123 |
|                      |               | Rep. 4     | 1.1472| 1.0659 | 1.0555 | 1.1281 | 1.1668 | 1.1998 |
| Mean % Cell Viability | A600          | Rep. 1     | 0.6568| 0.8058 | 0.6521 | 0.8702 | 0.7814 | 0.8249 |
|                      |               | Rep. 2     | 0.8626| 0.8734 | 2.0876 | 0.8702 | 0.8966 | 0.8882 |
|                      |               | Rep. 3     | 0.8162| 0.7755 | 0.9804 | 1.0262 | 0.9785 | 0.7266 |
|                      |               | Rep. 4     | 0.8145| 0.9318 | 0.9941 | 0.9994 | 0.8577 | 1.0238 |
| Mean % Cell Viability | A570          | Rep. 1     | 1.20635| 1.07825| 1.36698 | 1.17083 | 1.21088 | 1.17443 |
|                      |               | Rep. 2     | 1.302| 1.0736 | 2.0665 | 1.1893 | 1.2698 | 1.1701 |
|                      |               | Rep. 3     | 1.2233| 1.0479 | 1.2537 | 1.1769 | 1.2981 | 1.1123 |
|                      |               | Rep. 4     | 1.1472| 1.0659 | 1.0555 | 1.1281 | 1.1668 | 1.1998 |
| Mean % Cell Viability | A600          | Rep. 1     | 0.6568| 0.8058 | 0.6521 | 0.8702 | 0.7814 | 0.8249 |
|                      |               | Rep. 2     | 0.8626| 0.8734 | 2.0876 | 0.8702 | 0.8966 | 0.8882 |
|                      |               | Rep. 3     | 0.8162| 0.7755 | 0.9804 | 1.0262 | 0.9785 | 0.7266 |
|                      |               | Rep. 4     | 0.8145| 0.9318 | 0.9941 | 0.9994 | 0.8577 | 1.0238 |
| Mean % Cell Viability | A570          | Rep. 1     | 1.1465| 1.0529 | 0.9879 | 1.4099 | 1.0342 | 1.215 |
|                      |               | Rep. 2     | 1.1237| 1.1887 | 1.251 | 1.2178 | 1.274 | 1.2613 |
|                      |               | Rep. 3     | 1.3081| 1.3231 | 1.2296 | 1.2199 | 1.3973 | 1.3347 |
|                      |               | Rep. 4     | 1.053| 1.2915 | 1.3369 | 1.3105 | 1.3249 | 1.3175 |
| Mean % Cell Viability | A600          | Rep. 1     | 0.54| 0.7176 | 0.7193 | 1.195 | 0.7924 | 0.9112 |
|                      |               | Rep. 2     | 0.6766| 0.8633 | 1.1052 | 0.8249 | 1.0303 | 1.0017 |
|                      |               | Rep. 3     | 0.528| 1.2248 | 0.9405 | 1.1032 | 1.1282 | 1.0617 |
|                      |               | Rep. 4     | 0.7152| 1.019 | 1.0162 | 1.0546 | 1.0763 | 1.039 |
| Mean % Cell Viability | A570          | Rep. 1     | 0.71495| 0.95618| 0.9453 | 1.04442 | 1.0068 | 1.0034 |
|                      |               | Rep. 2     | 0.44287| 0.25787| 0.25605 | 0.2451 | 0.2508 | 0.27872 |
|                      |               | Rep. 3     | 0.58227| 57.8154| 55.3429 | 56.63 | 62.9354 |
| Mean % Cell Viability | ± SD          | Rep. 1     | 100±0| 50.0718±11.69| 53.3628±7.26 | 57.0361±8.34 | 63.9167±13.37 | 65.2644±7.52 |
Table 9
Data for cytotoxicity of 5FU against PNT1A normal cells using the Resazurin metabolic assay.

| Concentration (µg/ml) | Wavelength/µm | Replicates | Blank | 200 | 100 | 50 | 25 | 12.5 |
|-----------------------|---------------|------------|-------|-----|-----|----|----|------|
| Exp. 1 A570           |               | Rep. 1     | 1.0662| 0.9282| 1.0414| 1.085 | 1.0312| 1.0644 |
|                       |               | Rep. 2     | 1.0252| 0.9183| 1.1152| 1.0759| 1.0472| 1.1821 |
|                       |               | Rep. 3     | 1.0735| 0.9439| 1.2742| 1.1065| 1.1835| 1.2094 |
|                       |               | Rep. 4     | 1.0679| 0.8617| 0.9168| 1.1691| 1.0481| 1.1196 |
|                       | Mean Absorbance of Reps. | | 1.0582| 0.91302| 1.0869| 1.10913| 1.0775| 1.14388 |
| A600                  |               | Rep. 1     | 0.4355| 0.4771| 0.47 | 0.482 | 0.5063 | 0.5058 |
|                       |               | Rep. 2     | 0.5535| 1.0198| 0.675 | 0.6988 | 0.6371 | 0.6727 |
|                       |               | Rep. 3     | 0.507 | 0.7099| 0.8579| 0.6031 | 0.852 | 0.7457 |
|                       |               | Rep. 4     | 0.5895| 1.0908| 0.5706| 0.7968 | 0.6933 | 0.7201 |
|                       | Mean Absorbance of Reps. | | 0.52138| 0.8244| 0.64338| 0.64518| 0.67217| 0.66107 |
| Net Absorbance (A570-A600) | | | 0.53682| 0.08862| 0.44352| 0.46395| 0.40533| 0.4828 |
| % Cell Viability      | 100           | 16.5091    | 82.62 | 86.4248 | 75.5041 | 89.9362 |
|                       | Exp. 2 A570   | Rep. 1     | 1.0403| 0.9842| 0.9956| 1.0839 | 1.0614 | 1.0555 |
|                       |               | Rep. 2     | 1.0948| 1.3729| 1.0657| 1.088 | 0.9943 | 0.9717 |
|                       |               | Rep. 3     | 1.0239| 1.2624| 0.9841| 1.0846| 1.0802 | 1.1183 |
|                       |               | Rep. 4     | 1.0595| 1.2985| 1.0744| 1.0832| 1.07   | 1.1113 |
|                       | Mean Absorbance of Reps. | | 1.05463| 1.2295| 1.02995| 1.08492| 1.05148| 1.0642 |
| A600                  |               | Rep. 1     | 0.6439| 0.4771| 0.5945| 0.4893 | 0.4823 | 0.4356 |
|                       |               | Rep. 2     | 0.456 | 1.0198| 0.5494| 0.6673 | 0.6906 | 0.5797 |
|                       |               | Rep. 3     | 0.6273| 0.7099| 0.701 | 0.6897 | 0.633 | 0.5618 |
|                       |               | Rep. 4     | 0.4868| 1.0908| 0.6393| 0.6875 | 0.6322 | 0.6472 |
|                       | Mean Absorbance of Reps. | | 0.5535| 0.8244| 0.62105| 0.63345| 0.60953| 0.55607 |
| Net Absorbance (A570-A600) | | | 0.50113| 0.4051| 0.4089| 0.45147| 0.44195| 0.50812 |
| % Cell Viability      | 100           | 80.3831    | 81.5964| 90.0923| 88.1916| 101.397 |
|                       | Exp. 3 A570   | Rep. 1     | 1.4067| 1.1149| 1.2754| 1.2814| 1.2513| 1.3242 |
|                       |               | Rep. 2     | 1.3437| 1.246 | 1.1233| 1.2189| 1.2208| 1.216 |
|                       |               | Rep. 3     | 1.1885| 1.2462| 1.1105| 1.1816| 1.2943| 1.1357 |
|                       |               | Rep. 4     | 1.3056| 1.2599| 1.1501| 1.0690| 1.2266| 1.1305 |
|                       | Mean Absorbance of Reps. | | 1.31113| 1.21675| 1.16482| 1.1722| 1.24825| 1.2016 |
| A600                  |               | Rep. 1     | 0.8095| 0.9102| 0.8707| 1.0449 | 0.9541 | 0.7732 |
|                       |               | Rep. 2     | 0.5971| 0.623 | 0.6806| 0.7104 | 0.6601 | 0.741 |
|                       |               | Rep. 3     | 0.5568| 0.9252| 0.7461| 0.708 | 0.6388 | 0.5442 |
|                       |               | Rep. 4     | 0.6509| 0.9023| 0.7008| 0.6725 | 0.6796 | 0.66 |
|                       | Mean Absorbance of Reps. | | 0.65358| 0.84018| 0.74955| 0.78395| 0.73315| 0.6796 |
| Net Absorbance (A570-A600) | | | 0.65755| 0.37657| 0.41527| 0.38825| 0.5151 | 0.522 |
| % Cell Viability      | 100           | 57.2694    | 63.1549| 59.0449| 78.3362| 79.3856 |
% Mean Cell Viability ± SD | 100 ± 0 | 51.5389 ± 32.55 | 75.7904 ± 10.95 | 78.5207 ± 16.97 | 80.6773 ± 6.66 | 90.2396 ± 11.0 |
2. Experimental design, materials, and methods

2.1. Chemicals and reagents

All chemicals and reagents were procured from certified suppliers and were of the highest analytical standard. DMEM, RPMI1640, Penicillin/Streptomycin, Non-Essential Amino Acids, Trypsin-EDTA, and Resazurin were obtained from Solarbio (China). FCS, 5FU, Phosphate buffered saline (PBS) and Dimethyl Sulfoxide (DMSO) were obtained from Sigma Aldrich (Germany).

2.2. The silver nanoparticles

Previously prepared and characterized AgNPs from ethanolic extracts of fruits and leaves of *Annona muricata* were used for the study from which the current data was obtained [1,2]. AgNPs-F used had an absorption maximum at 427 nm and were stable under different pH, Temperature and storage conditions. The AgNPs-F had an average crystalline size of 60.12 nm, a polydispersity index of 0.1235 and were spherical in nature. The functional groups responsible for the formation of the AgNPs included;

![Graph showing the Cytotoxicity of AgNPs-F against HeLa Cells using the Resazurin Metabolic Assay.](image1)

![Graph showing the Cytotoxicity of AgNPs-F against PC3 Cells using the Resazurin Metabolic Assay.](image2)
Fig. 3. A graph showing the Cytotoxicity of AgNPs-F against PNT1A Cells using the Resazurin Metabolic Assay.

Fig. 4. A graph showing the Cytotoxicity of AgNPs-L against HeLa Cells using the Resazurin Metabolic Assay.

Fig. 5. A graph showing the Cytotoxicity of AgNPs-L against PC3 Cells using the Resazurin Metabolic Assay.
Alkanes and alkyls, aldehydes and esters, nitro groups, alcohol groups, amines, amides, alkenes, acids and alkyl halides [1,2]. On the other hand, AgNPs-L used had an absorption maximum at 429 nm and were stable under different pH, Temperature and storage conditions. The AgNPs-L had an average crystalline size of 87.36 nm, a polydispersity index of 0.16 and were spherical in nature. The functional groups responsible for the formation of the AgNPs included; Alkanes and alkyls, aldehydes and esters, nitro groups, alcohol groups, amines, amides, alkenes, acids and alkyl halides [1].

2.3. Cell lines

The HeLa and PC-3 cells were Cervical and Prostate adenocarcinomas respectively. On the other hand, the PNT1A cells were normal immortalized prostate cells. HeLa, PC3, and PNT1A were sourced from the European collection of Animal Cell Cultures (ECACC). All cells were adherent.

Fig. 6. A graph showing the Cytotoxicity of AgNPs-L against PNT1A Cells using the Resazurin Metabolic Assay.

Fig. 7. A graph showing the Cytotoxicity of 5FU against HeLa Cells using the Resazurin Assay.
2.4. Cell culture

The cells were grown separately in appropriate media (HeLa in DMEM; PC3 and PNT1A in RPMI 1640) containing L-Glutamine and supplemented with 10% batch tested inactivated fetal calf serum (FCS), 1% Penicillin/Streptomycin, and 1% Non-essential amino acids. The cells were kept an incubator at 37°C, 5% CO2; and 95% humidity. Cells were Trypsinized and passaged 1–2 times a week and were harvested and used for the assays during their logarithmic growth phase at about 60–75% confluence.

2.5. Preparation of the AgNPs solutions, 5-FU and blanks in media

AgNPs-F and AgNPs-L stock solutions (10mg/ml) were prepared by dispersing them in 0.5% DMSO in culture media. Briefly, 100mg of the AgNPs were dispersed in 10 mL of culture medium (containing Dimethyl Sulfoxide (DMSO) of 0.5% v/v). Required treatment concentrations of (200, 100, 50, 25, and...
12.5 μg/mL were then made by dilutions of the stock solutions using the formula $C_1V_1 = C_2V_2$. To prepare the standard anticancer treatment regimen of 5-FU, a stock solution was prepared as above and then diluted with culture media to desired concentrations ranging from 12.5 to 200 μg/mL. The final concentration of dimethyl sulfoxide (DMSO) in each cell culture did not exceed 1% v/v to keep the cytotoxicity of DMSO low [3].

2.6. Measurement of the anticancer activities of the AgNPs and 5FU using the Resazurin Assay

The effects of the AgNPs on each of the cell lines’ viability and death was determined using the Resazurin (7-hydroxy-10-oxido- phenoxazin-10-ium-3-one) assay as previously described [4–7]. Exponentially growing cells were harvested, washed and seeded in 96 well plates containing 0.5 x 10^4 cells/well and incubated with 100 μL per well culture media and allowed to attach overnight. Seeding media was then removed from each of the plates. The attached cultured cells were then treated by adding of 100 μL of the treatments at concentrations of 200, 100, 50, 25, and 12.5 μg/mL (in culture media). In addition, the DMSO alone in media was added to another set of cells as the solvent control blank (DMSO = 0.5% v/v). Standard drug 5-FU was used as a reference drug for cancer as positive control. The treated cells were then incubated in a humidified CO2 incubator at 37 °C. 24 Hours from the start of the incubation, 20 μl resazurin at a concentration of 0.15mg/ml in PBS was added to each of the wells and then incubated at 37 °C for an additional 4 hours. After 4 hours from the addition of resazurin, the plates containing the treated cells were then retrieved from the incubator and the absorbance signal was quickly measured at 570/600nm (excitation/emission wavelengths), using a microplate reader (Infinite M1000, Tecan). Each treatment was read in at least four replicates.

2.7. How the data can be analyzed

The presented data can be analyzed by determining the percentage cell viability using the formula: % Viability = (Net absorbance of treated samples/Net absorbance of blank) x 100. The effect of the samples on the proliferation of the cell lines can then be expressed in form of graphs of percentage cell viability against logarithm of concentration as shown in Figures (1–9) under the data section above. Fifty percent of inhibitory concentration (IC50) or cytotoxic concentration (CC50) of each of the treatments can then be calculated from the growth inhibition curves.

Research clearance and registration

The study from which the current data was obtained was cleared by the PAUSTI board of examiners (MB400-0007/17), The Uganda National Council for Science and Technology (NS 43ES) as well as the Jomo Kenyatta University of Agriculture and Technology Institutional Ethics Review Committee (Ref. no: JKU/2/4/896B).

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
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