***Hibiscus sabdariffa* synthesized gold** **nanoparticles ameliorate aluminum chloride induced memory deficits through inhibition of COX-2/BACE-1 mRNA expression in rats**

Scholastica O. Anadoziea\*, Duncan O. Effioma, Olusola B. Adewalea, Jodie Judea, Itumeleng Zoselab, Oluwole B. Akawacd, Juliet N. Olayinkae and Saartjie Rouxb

aBiochemistry Program, Department of Chemical Sciences, Afe Babalola University, P.M.B 5454, Ado-Ekiti, Nigeria.

bDepartment of Human Physiology, Nelson Mandela University, P.O Box 77000, Port Elizabeth, South Africa.

cDepartment of Pharmacology and Toxicology, College of Pharmacy, Afe Babalola University, P.M.B 5454, Ado-Ekiti, Nigeria.

dMolecular Biocomputation and Drug Design Laboratory, School of Health Sciences, University of KwaZulu-Natal, Westville Campus, Durban, 4001, South Africa.

eDepartment of Pharmacology and Therapeutics, College of Medicine and Health Sciences, Afe Babalola University, P.M.B 5454, Ado-Ekiti, Nigeria.

**\*Author to whom correspondence should be addressed.**

**Email address:** anadozieso@abuad.edu.ng;scholanad2019@gmail.com

**Mobile number:** +234 813 3254 737

**ORCID:** 0000-0003-4118-4611

Table S1: UV-vis absorption values of *H. sabdariffa* synthesized-AuNPs at 1, 24 and 48 h interval

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HS-AuNPs |  |  |  |  |
| Absorbance Spectrum 1 |  |  |  |  |
| Wavelength: 350-750 nm |  |  |  |  |
|  |  |  |  |  |
| Wavelength | 1 hr after synthesis (centrifuged)  | 24hr after synthesis (centrifuged) | 48hr after synthesis (centrifuged) |  |
| 350 | 0.403 | 0.404 | 0.404 |  |
| 351 | 0.403 | 0.403 | 0.404 |  |
| 352 | 0.402 | 0.402 | 0.402 |  |
| 353 | 0.401 | 0.401 | 0.402 |  |
| 354 | 0.401 | 0.401 | 0.402 |  |
| 355 | 0.400 | 0.400 | 0.401 |  |
| 356 | 0.400 | 0.400 | 0.400 |  |
| 357 | 0.399 | 0.399 | 0.400 |  |
| 358 | 0.399 | 0.398 | 0.399 |  |
| 359 | 0.398 | 0.398 | 0.399 |  |
| 360 | 0.397 | 0.397 | 0.399 |  |
| 361 | 0.396 | 0.396 | 0.398 |  |
| 362 | 0.396 | 0.396 | 0.397 |  |
| 363 | 0.395 | 0.395 | 0.396 |  |
| 364 | 0.394 | 0.394 | 0.396 |  |
| 365 | 0.394 | 0.394 | 0.395 |  |
| 366 | 0.393 | 0.393 | 0.394 |  |
| 367 | 0.392 | 0.392 | 0.393 |  |
| 368 | 0.391 | 0.391 | 0.392 |  |
| 369 | 0.390 | 0.390 | 0.391 |  |
| 370 | 0.390 | 0.390 | 0.390 |  |
| 371 | 0.388 | 0.388 | 0.389 |  |
| 372 | 0.387 | 0.387 | 0.388 |  |
| 373 | 0.386 | 0.386 | 0.387 |  |
| 374 | 0.385 | 0.385 | 0.387 |  |
| 375 | 0.384 | 0.384 | 0.386 |  |
| 376 | 0.384 | 0.384 | 0.384 |  |
| 377 | 0.383 | 0.383 | 0.384 |  |
| 378 | 0.382 | 0.382 | 0.383 |  |
| 379 | 0.381 | 0.381 | 0.382 |  |
| 380 | 0.381 | 0.381 | 0.382 |  |
| 381 | 0.380 | 0.380 | 0.381 |  |
| 382 | 0.379 | 0.379 | 0.380 |  |
| 383 | 0.378 | 0.378 | 0.379 |  |
| 384 | 0.378 | 0.378 | 0.378 |  |
| 385 | 0.377 | 0.377 | 0.378 |  |
| 386 | 0.376 | 0.376 | 0.377 |  |
| 387 | 0.375 | 0.375 | 0.376 |  |
| 388 | 0.374 | 0.374 | 0.375 |  |
| 389 | 0.373 | 0.373 | 0.374 |  |
| 390 | 0.373 | 0.373 | 0.373 |  |
| 391 | 0.372 | 0.372 | 0.373 |  |
| 392 | 0.371 | 0.371 | 0.372 |  |
| 393 | 0.370 | 0.370 | 0.371 |  |
| 394 | 0.369 | 0.369 | 0.370 |  |
| 395 | 0.368 | 0.368 | 0.369 |  |
| 396 | 0.368 | 0.368 | 0.368 |  |
| 397 | 0.366 | 0.366 | 0.367 |  |
| 398 | 0.366 | 0.366 | 0.366 |  |
| 399 | 0.365 | 0.365 | 0.366 |  |
| 400 | 0.364 | 0.364 | 0.365 |  |
| 401 | 0.364 | 0.364 | 0.364 |  |
| 402 | 0.363 | 0.363 | 0.364 |  |
| 403 | 0.362 | 0.362 | 0.362 |  |
| 404 | 0.362 | 0.362 | 0.362 |  |
| 405 | 0.361 | 0.361 | 0.362 |  |
| 406 | 0.361 | 0.361 | 0.361 |  |
| 407 | 0.360 | 0.360 | 0.361 |  |
| 408 | 0.359 | 0.359 | 0.360 |  |
| 409 | 0.359 | 0.359 | 0.360 |  |
| 410 | 0.358 | 0.358 | 0.359 |  |
| 411 | 0.358 | 0.358 | 0.358 |  |
| 412 | 0.357 | 0.357 | 0.358 |  |
| 413 | 0.356 | 0.356 | 0.357 |  |
| 414 | 0.356 | 0.356 | 0.356 |  |
| 415 | 0.356 | 0.356 | 0.356 |  |
| 416 | 0.355 | 0.355 | 0.355 |  |
| 417 | 0.355 | 0.355 | 0.355 |  |
| 418 | 0.354 | 0.354 | 0.354 |  |
| 419 | 0.353 | 0.353 | 0.354 |  |
| 420 | 0.353 | 0.353 | 0.353 |  |
| 421 | 0.352 | 0.352 | 0.352 |  |
| 422 | 0.352 | 0.352 | 0.353 |  |
| 423 | 0.352 | 0.352 | 0.352 |  |
| 424 | 0.351 | 0.351 | 0.352 |  |
| 425 | 0.351 | 0.351 | 0.351 |  |
| 426 | 0.351 | 0.351 | 0.351 |  |
| 427 | 0.350 | 0.350 | 0.350 |  |
| 428 | 0.350 | 0.350 | 0.350 |  |
| 429 | 0.350 | 0.350 | 0.350 |  |
| 430 | 0.349 | 0.349 | 0.349 |  |
| 431 | 0.349 | 0.349 | 0.349 |  |
| 432 | 0.349 | 0.349 | 0.349 |  |
| 433 | 0.349 | 0.349 | 0.349 |  |
| 434 | 0.348 | 0.348 | 0.348 |  |
| 435 | 0.348 | 0.348 | 0.348 |  |
| 436 | 0.348 | 0.348 | 0.348 |  |
| 437 | 0.348 | 0.348 | 0.348 |  |
| 438 | 0.348 | 0.348 | 0.348 |  |
| 439 | 0.348 | 0.348 | 0.348 |  |
| 440 | 0.347 | 0.347 | 0.348 |  |
| 441 | 0.347 | 0.347 | 0.347 |  |
| 442 | 0.347 | 0.347 | 0.347 |  |
| 443 | 0.347 | 0.347 | 0.347 |  |
| 444 | 0.347 | 0.347 | 0.347 |  |
| 445 | 0.347 | 0.347 | 0.347 |  |
| 446 | 0.347 | 0.347 | 0.347 |  |
| 447 | 0.347 | 0.347 | 0.347 |  |
| 448 | 0.348 | 0.348 | 0.348 |  |
| 449 | 0.348 | 0.348 | 0.348 |  |
| 450 | 0.348 | 0.348 | 0.348 |  |
| 451 | 0.348 | 0.348 | 0.348 |  |
| 452 | 0.349 | 0.349 | 0.348 |  |
| 453 | 0.349 | 0.349 | 0.349 |  |
| 454 | 0.349 | 0.349 | 0.349 |  |
| 455 | 0.349 | 0.349 | 0.349 |  |
| 456 | 0.350 | 0.350 | 0.350 |  |
| 457 | 0.350 | 0.350 | 0.350 |  |
| 458 | 0.351 | 0.351 | 0.350 |  |
| 459 | 0.351 | 0.351 | 0.351 |  |
| 460 | 0.351 | 0.351 | 0.351 |  |
| 461 | 0.352 | 0.352 | 0.352 |  |
| 462 | 0.352 | 0.352 | 0.352 |  |
| 463 | 0.353 | 0.353 | 0.353 |  |
| 464 | 0.354 | 0.354 | 0.354 |  |
| 465 | 0.355 | 0.355 | 0.355 |  |
| 466 | 0.356 | 0.356 | 0.356 |  |
| 467 | 0.357 | 0.357 | 0.357 |  |
| 468 | 0.358 | 0.358 | 0.358 |  |
| 469 | 0.360 | 0.360 | 0.359 |  |
| 470 | 0.361 | 0.361 | 0.360 |  |
| 471 | 0.362 | 0.362 | 0.362 |  |
| 472 | 0.364 | 0.364 | 0.363 |  |
| 473 | 0.365 | 0.365 | 0.365 |  |
| 474 | 0.367 | 0.367 | 0.366 |  |
| 475 | 0.368 | 0.368 | 0.367 |  |
| 476 | 0.370 | 0.370 | 0.369 |  |
| 477 | 0.371 | 0.371 | 0.371 |  |
| 478 | 0.373 | 0.373 | 0.373 |  |
| 479 | 0.374 | 0.374 | 0.374 |  |
| 480 | 0.377 | 0.377 | 0.376 |  |
| 481 | 0.378 | 0.378 | 0.378 |  |
| 482 | 0.381 | 0.381 | 0.380 |  |
| 483 | 0.383 | 0.383 | 0.383 |  |
| 484 | 0.385 | 0.385 | 0.385 |  |
| 485 | 0.387 | 0.387 | 0.387 |  |
| 486 | 0.390 | 0.390 | 0.389 |  |
| 487 | 0.393 | 0.393 | 0.392 |  |
| 488 | 0.397 | 0.397 | 0.396 |  |
| 489 | 0.399 | 0.399 | 0.399 |  |
| 490 | 0.403 | 0.403 | 0.402 |  |
| 491 | 0.407 | 0.407 | 0.407 |  |
| 492 | 0.411 | 0.411 | 0.410 |  |
| 493 | 0.414 | 0.414 | 0.414 |  |
| 494 | 0.418 | 0.418 | 0.418 |  |
| 495 | 0.423 | 0.423 | 0.422 |  |
| 496 | 0.427 | 0.427 | 0.426 |  |
| 497 | 0.431 | 0.431 | 0.430 |  |
| 498 | 0.434 | 0.434 | 0.434 |  |
| 499 | 0.438 | 0.438 | 0.437 |  |
| 500 | 0.442 | 0.442 | 0.441 |  |
| 501 | 0.446 | 0.446 | 0.445 |  |
| 502 | 0.450 | 0.450 | 0.449 |  |
| 503 | 0.453 | 0.453 | 0.452 |  |
| 504 | 0.457 | 0.457 | 0.456 |  |
| 505 | 0.461 | 0.461 | 0.459 |  |
| 506 | 0.465 | 0.465 | 0.463 |  |
| 507 | 0.468 | 0.468 | 0.467 |  |
| 508 | 0.473 | 0.473 | 0.471 |  |
| 509 | 0.477 | 0.477 | 0.475 |  |
| 510 | 0.481 | 0.481 | 0.479 |  |
| 511 | 0.485 | 0.485 | 0.484 |  |
| 512 | 0.489 | 0.489 | 0.488 |  |
| 513 | 0.494 | 0.494 | 0.492 |  |
| 514 | 0.498 | 0.498 | 0.497 |  |
| 515 | 0.502 | 0.502 | 0.501 |  |
| 516 | 0.506 | 0.506 | 0.504 |  |
| 517 | 0.510 | 0.510 | 0.508 |  |
| 518 | 0.513 | 0.513 | 0.512 |  |
| 519 | 0.516 | 0.516 | 0.515 |  |
| 520 | 0.519 | 0.519 | 0.517 |  |
| 521 | 0.522 | 0.522 | 0.520 |  |
| 522 | 0.524 | 0.524 | 0.523 |  |
| 523 | 0.526 | 0.526 | 0.525 |  |
| 524 | 0.528 | 0.528 | 0.527 |  |
| 525 | 0.531 | 0.531 | 0.528 |  |
| 526 | 0.532 | 0.532 | 0.530 |  |
| 527 | 0.533 | 0.533 | 0.531 |  |
| 528 | 0.535 | 0.535 | 0.533 |  |
| 529 | 0.536 | 0.536 | 0.534 |  |
| 530 | 0.536 | 0.536 | 0.535 |  |
| 531 | 0.537 | 0.537 | 0.535 |  |
| 532 | 0.538 | 0.538 | 0.536 |  |
| 533 | 0.538 | 0.538 | 0.537 |  |
| 534 | 0.539 | 0.539 | 0.537 |  |
| 535 | 0.539 | 0.539 | 0.537 |  |
| 536 | 0.539 | 0.539 | 0.537 |  |
| 537 | 0.538 | 0.538 | 0.537 |  |
| 538 | 0.538 | 0.538 | 0.536 |  |
| 539 | 0.537 | 0.537 | 0.535 |  |
| 540 | 0.536 | 0.536 | 0.533 |  |
| 541 | 0.534 | 0.534 | 0.532 |  |
| 542 | 0.533 | 0.533 | 0.531 |  |
| 543 | 0.532 | 0.532 | 0.529 |  |
| 544 | 0.529 | 0.529 | 0.527 |  |
| 545 | 0.527 | 0.527 | 0.525 |  |
| 546 | 0.525 | 0.525 | 0.523 |  |
| 547 | 0.523 | 0.523 | 0.521 |  |
| 548 | 0.522 | 0.522 | 0.520 |  |
| 549 | 0.519 | 0.519 | 0.516 |  |
| 550 | 0.517 | 0.517 | 0.515 |  |
| 551 | 0.515 | 0.515 | 0.512 |  |
| 552 | 0.512 | 0.512 | 0.510 |  |
| 553 | 0.509 | 0.509 | 0.507 |  |
| 554 | 0.506 | 0.506 | 0.505 |  |
| 555 | 0.504 | 0.504 | 0.502 |  |
| 556 | 0.500 | 0.500 | 0.498 |  |
| 557 | 0.497 | 0.497 | 0.495 |  |
| 558 | 0.493 | 0.493 | 0.492 |  |
| 559 | 0.490 | 0.490 | 0.488 |  |
| 560 | 0.486 | 0.486 | 0.484 |  |
| 561 | 0.482 | 0.482 | 0.480 |  |
| 562 | 0.478 | 0.478 | 0.476 |  |
| 563 | 0.473 | 0.473 | 0.471 |  |
| 564 | 0.469 | 0.469 | 0.468 |  |
| 565 | 0.465 | 0.465 | 0.463 |  |
| 566 | 0.461 | 0.461 | 0.459 |  |
| 567 | 0.457 | 0.457 | 0.455 |  |
| 568 | 0.453 | 0.453 | 0.450 |  |
| 569 | 0.448 | 0.448 | 0.447 |  |
| 570 | 0.445 | 0.445 | 0.444 |  |
| 571 | 0.442 | 0.442 | 0.441 |  |
| 572 | 0.438 | 0.438 | 0.437 |  |
| 573 | 0.434 | 0.434 | 0.433 |  |
| 574 | 0.431 | 0.431 | 0.429 |  |
| 575 | 0.428 | 0.428 | 0.427 |  |
| 576 | 0.425 | 0.425 | 0.423 |  |
| 577 | 0.421 | 0.421 | 0.419 |  |
| 578 | 0.417 | 0.417 | 0.415 |  |
| 579 | 0.413 | 0.413 | 0.412 |  |
| 580 | 0.409 | 0.409 | 0.407 |  |
| 581 | 0.406 | 0.406 | 0.404 |  |
| 582 | 0.401 | 0.401 | 0.400 |  |
| 583 | 0.395 | 0.395 | 0.395 |  |
| 584 | 0.391 | 0.391 | 0.390 |  |
| 585 | 0.387 | 0.387 | 0.386 |  |
| 586 | 0.383 | 0.383 | 0.382 |  |
| 587 | 0.378 | 0.378 | 0.377 |  |
| 588 | 0.373 | 0.373 | 0.372 |  |
| 589 | 0.369 | 0.369 | 0.368 |  |
| 590 | 0.366 | 0.366 | 0.365 |  |
| 591 | 0.361 | 0.361 | 0.360 |  |
| 592 | 0.357 | 0.357 | 0.356 |  |
| 593 | 0.352 | 0.352 | 0.352 |  |
| 594 | 0.348 | 0.348 | 0.348 |  |
| 595 | 0.347 | 0.347 | 0.346 |  |
| 596 | 0.343 | 0.343 | 0.342 |  |
| 597 | 0.339 | 0.339 | 0.338 |  |
| 598 | 0.335 | 0.335 | 0.335 |  |
| 599 | 0.332 | 0.332 | 0.332 |  |
| 600 | 0.329 | 0.329 | 0.328 |  |
| 601 | 0.326 | 0.326 | 0.325 |  |
| 602 | 0.322 | 0.322 | 0.322 |  |
| 603 | 0.318 | 0.318 | 0.317 |  |
| 604 | 0.313 | 0.313 | 0.313 |  |
| 605 | 0.310 | 0.310 | 0.309 |  |
| 606 | 0.305 | 0.305 | 0.305 |  |
| 607 | 0.302 | 0.302 | 0.301 |  |
| 608 | 0.296 | 0.296 | 0.297 |  |
| 609 | 0.292 | 0.292 | 0.292 |  |
| 610 | 0.288 | 0.288 | 0.288 |  |
| 611 | 0.283 | 0.283 | 0.284 |  |
| 612 | 0.279 | 0.279 | 0.280 |  |
| 613 | 0.276 | 0.276 | 0.275 |  |
| 614 | 0.270 | 0.270 | 0.271 |  |
| 615 | 0.267 | 0.267 | 0.266 |  |
| 616 | 0.264 | 0.264 | 0.264 |  |
| 617 | 0.261 | 0.261 | 0.261 |  |
| 618 | 0.257 | 0.257 | 0.257 |  |
| 619 | 0.254 | 0.254 | 0.254 |  |
| 620 | 0.251 | 0.251 | 0.251 |  |
| 621 | 0.247 | 0.247 | 0.248 |  |
| 622 | 0.244 | 0.244 | 0.245 |  |
| 623 | 0.241 | 0.241 | 0.241 |  |
| 624 | 0.238 | 0.238 | 0.238 |  |
| 625 | 0.234 | 0.234 | 0.235 |  |
| 626 | 0.231 | 0.231 | 0.232 |  |
| 627 | 0.228 | 0.228 | 0.228 |  |
| 628 | 0.224 | 0.224 | 0.225 |  |
| 629 | 0.220 | 0.220 | 0.221 |  |
| 630 | 0.217 | 0.217 | 0.217 |  |
| 631 | 0.214 | 0.214 | 0.214 |  |
| 632 | 0.209 | 0.209 | 0.209 |  |
| 633 | 0.207 | 0.207 | 0.206 |  |
| 634 | 0.203 | 0.203 | 0.204 |  |
| 635 | 0.199 | 0.199 | 0.199 |  |
| 636 | 0.195 | 0.195 | 0.196 |  |
| 637 | 0.193 | 0.193 | 0.193 |  |
| 638 | 0.190 | 0.190 | 0.190 |  |
| 639 | 0.187 | 0.187 | 0.188 |  |
| 640 | 0.183 | 0.183 | 0.185 |  |
| 641 | 0.181 | 0.181 | 0.181 |  |
| 642 | 0.180 | 0.180 | 0.180 |  |
| 643 | 0.177 | 0.177 | 0.177 |  |
| 644 | 0.174 | 0.174 | 0.175 |  |
| 645 | 0.172 | 0.172 | 0.173 |  |
| 646 | 0.170 | 0.170 | 0.171 |  |
| 647 | 0.167 | 0.167 | 0.168 |  |
| 648 | 0.166 | 0.166 | 0.165 |  |
| 649 | 0.164 | 0.164 | 0.163 |  |
| 650 | 0.160 | 0.160 | 0.162 |  |
| 651 | 0.158 | 0.158 | 0.159 |  |
| 652 | 0.156 | 0.156 | 0.156 |  |
| 653 | 0.152 | 0.152 | 0.154 |  |
| 654 | 0.150 | 0.150 | 0.151 |  |
| 655 | 0.147 | 0.147 | 0.148 |  |
| 656 | 0.145 | 0.145 | 0.146 |  |
| 657 | 0.143 | 0.143 | 0.144 |  |
| 658 | 0.141 | 0.141 | 0.141 |  |
| 659 | 0.139 | 0.139 | 0.140 |  |
| 660 | 0.136 | 0.136 | 0.137 |  |
| 661 | 0.135 | 0.135 | 0.136 |  |
| 662 | 0.133 | 0.133 | 0.132 |  |
| 663 | 0.131 | 0.131 | 0.132 |  |
| 664 | 0.129 | 0.129 | 0.130 |  |
| 665 | 0.128 | 0.128 | 0.128 |  |
| 666 | 0.126 | 0.126 | 0.127 |  |
| 667 | 0.125 | 0.125 | 0.125 |  |
| 668 | 0.122 | 0.122 | 0.123 |  |
| 669 | 0.121 | 0.121 | 0.122 |  |
| 670 | 0.121 | 0.121 | 0.121 |  |
| 671 | 0.118 | 0.118 | 0.120 |  |
| 672 | 0.117 | 0.117 | 0.118 |  |
| 673 | 0.115 | 0.115 | 0.116 |  |
| 674 | 0.114 | 0.114 | 0.114 |  |
| 675 | 0.111 | 0.111 | 0.111 |  |
| 676 | 0.109 | 0.109 | 0.111 |  |
| 677 | 0.109 | 0.109 | 0.109 |  |
| 678 | 0.107 | 0.107 | 0.107 |  |
| 679 | 0.105 | 0.105 | 0.105 |  |
| 680 | 0.104 | 0.104 | 0.104 |  |
| 681 | 0.102 | 0.102 | 0.104 |  |
| 682 | 0.100 | 0.100 | 0.103 |  |
| 683 | 0.100 | 0.100 | 0.102 |  |
| 684 | 0.098 | 0.098 | 0.100 |  |
| 685 | 0.098 | 0.098 | 0.098 |  |
| 686 | 0.096 | 0.096 | 0.097 |  |
| 687 | 0.095 | 0.095 | 0.095 |  |
| 688 | 0.095 | 0.095 | 0.095 |  |
| 689 | 0.093 | 0.093 | 0.095 |  |
| 690 | 0.093 | 0.093 | 0.093 |  |
| 691 | 0.091 | 0.091 | 0.093 |  |
| 692 | 0.091 | 0.091 | 0.092 |  |
| 693 | 0.090 | 0.090 | 0.092 |  |
| 694 | 0.089 | 0.089 | 0.090 |  |
| 695 | 0.088 | 0.088 | 0.089 |  |
| 696 | 0.087 | 0.087 | 0.087 |  |
| 697 | 0.087 | 0.087 | 0.087 |  |
| 698 | 0.085 | 0.085 | 0.085 |  |
| 699 | 0.084 | 0.084 | 0.085 |  |
| 700 | 0.084 | 0.084 | 0.085 |  |
| 701 | 0.083 | 0.083 | 0.084 |  |
| 702 | 0.082 | 0.082 | 0.082 |  |
| 703 | 0.081 | 0.081 | 0.081 |  |
| 704 | 0.080 | 0.080 | 0.081 |  |
| 705 | 0.079 | 0.079 | 0.080 |  |
| 706 | 0.079 | 0.079 | 0.079 |  |
| 707 | 0.078 | 0.078 | 0.079 |  |
| 708 | 0.078 | 0.078 | 0.079 |  |
| 709 | 0.076 | 0.076 | 0.078 |  |
| 710 | 0.076 | 0.076 | 0.077 |  |
| 711 | 0.076 | 0.076 | 0.077 |  |
| 712 | 0.075 | 0.075 | 0.076 |  |
| 713 | 0.075 | 0.075 | 0.075 |  |
| 714 | 0.073 | 0.073 | 0.075 |  |
| 715 | 0.073 | 0.073 | 0.074 |  |
| 716 | 0.072 | 0.072 | 0.074 |  |
| 717 | 0.073 | 0.073 | 0.073 |  |
| 718 | 0.072 | 0.072 | 0.073 |  |
| 719 | 0.072 | 0.072 | 0.072 |  |
| 720 | 0.071 | 0.071 | 0.072 |  |
| 721 | 0.070 | 0.070 | 0.071 |  |
| 722 | 0.070 | 0.070 | 0.071 |  |
| 723 | 0.069 | 0.069 | 0.069 |  |
| 724 | 0.067 | 0.067 | 0.071 |  |
| 725 | 0.068 | 0.068 | 0.069 |  |
| 726 | 0.067 | 0.067 | 0.069 |  |
| 727 | 0.066 | 0.066 | 0.068 |  |
| 728 | 0.066 | 0.066 | 0.068 |  |
| 729 | 0.066 | 0.066 | 0.068 |  |
| 730 | 0.066 | 0.066 | 0.067 |  |
| 731 | 0.065 | 0.065 | 0.068 |  |
| 732 | 0.065 | 0.065 | 0.066 |  |
| 733 | 0.065 | 0.065 | 0.066 |  |
| 734 | 0.064 | 0.064 | 0.066 |  |
| 735 | 0.064 | 0.064 | 0.064 |  |
| 736 | 0.064 | 0.064 | 0.065 |  |
| 737 | 0.064 | 0.064 | 0.065 |  |
| 738 | 0.064 | 0.064 | 0.065 |  |
| 739 | 0.064 | 0.064 | 0.064 |  |
| 740 | 0.063 | 0.063 | 0.064 |  |
| 741 | 0.063 | 0.063 | 0.064 |  |
| 742 | 0.062 | 0.062 | 0.062 |  |
| 743 | 0.062 | 0.062 | 0.063 |  |
| 744 | 0.062 | 0.062 | 0.062 |  |
| 745 | 0.061 | 0.061 | 0.061 |  |
| 746 | 0.061 | 0.061 | 0.062 |  |
| 747 | 0.060 | 0.060 | 0.062 |  |
| 748 | 0.061 | 0.061 | 0.061 |  |
| 749 | 0.060 | 0.060 | 0.060 |  |
| 750 | 0.060 | 0.060 | 0.060 |  |
|   |   |  |  |  |
|  |  |  |  |  |



Figure S2: FT-IR absorption spectroscopic measurement of *H. sabdariffa* synthesized gold nanoparticles