



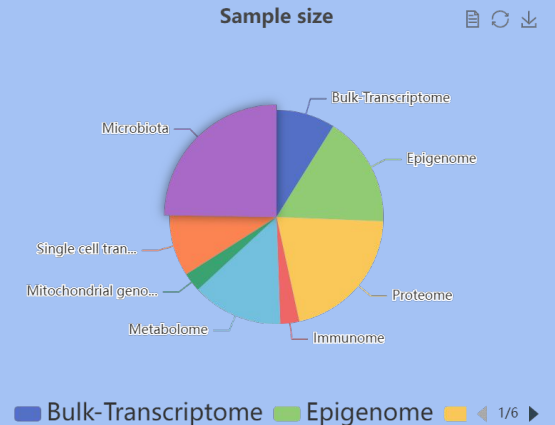
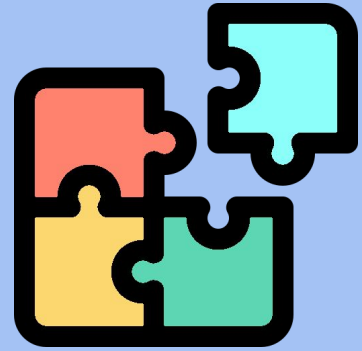
# The AgeAnnoMo Database

Natalija Stojanovic & Charlotte Kaplan



# Outline:

- The purpose of the database is to provide information about different hallmarks of aging and how they impact different species.
- This database focuses on providing a collection of age related data sets from a variety of larger databases.
- An explanation is provided as to why there is not a need for this database due to its lack of organization and amateur design.



# AgeAnnoMo database is a multi-omics database for animal aging

~AgeAnnoMo database contains:

- 136 datasets from 8 different modalities
- 8596 samples from 50 species
- Over 1 million cells

**136**  
Aging  
Datasets

**50**  
Species

**8596**  
Samples

**1M+**  
Cells

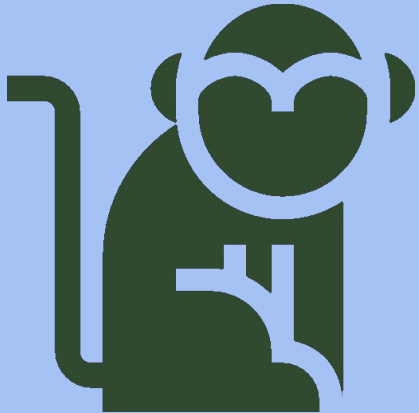
**12**  
Annotations

**10**  
Aging  
Hallmarks

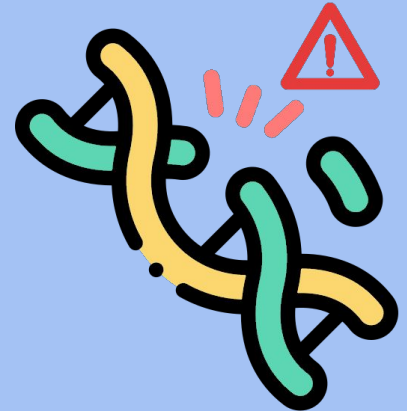
**8**  
Modalities

# AgeAnnoMO was created by three universities

- University of Texas Health, West China School of Medicine, and Xidian University are the creators of this database, however it is unclear if individual students or these organizations actually maintain it.
- AgeAnnoMO has been created through human curation because the species and the datasets are handpicked.

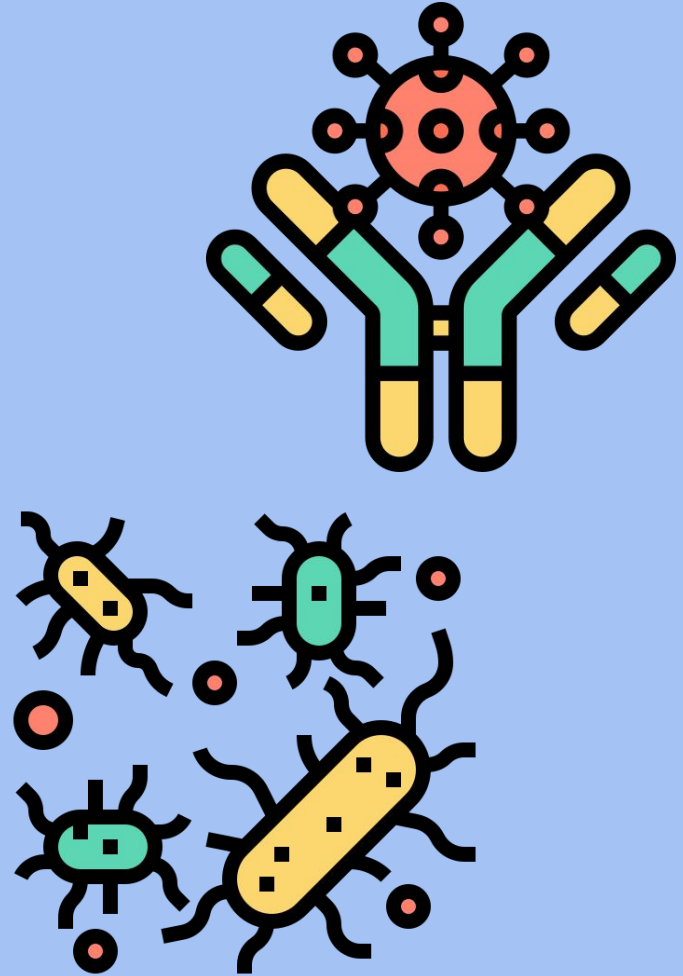


- ❖ It seems that a small lab group most likely put this database together, as this database seems to be a hobby, contributed to by three universities across the world. This database is limited in scope and does seem amateur.



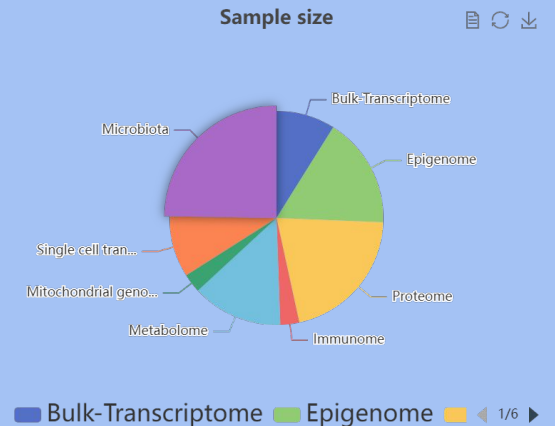
# AgeAnnoMO's claim:

- Aging is a multifaceted process involving the progressive decline of biological systems at various levels.
- Twelve hallmarks have been identified as common factors contributing to aging. These hallmarks are conserved across multiple species.
- AgeAnnoMO is a comprehensive knowledgebase of multi-omics annotation for animal aging.
- AgeAnnoMO aids in identifying targetable biomarkers for aging research.



# Outline:




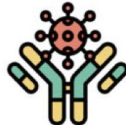



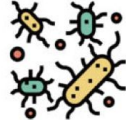



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# There are 11 hallmarks of aging for 20 species

- The database claims to cover 50 species, but when browsing the variety of species there is only 20 available.

**Browse by hallmarks of aging**

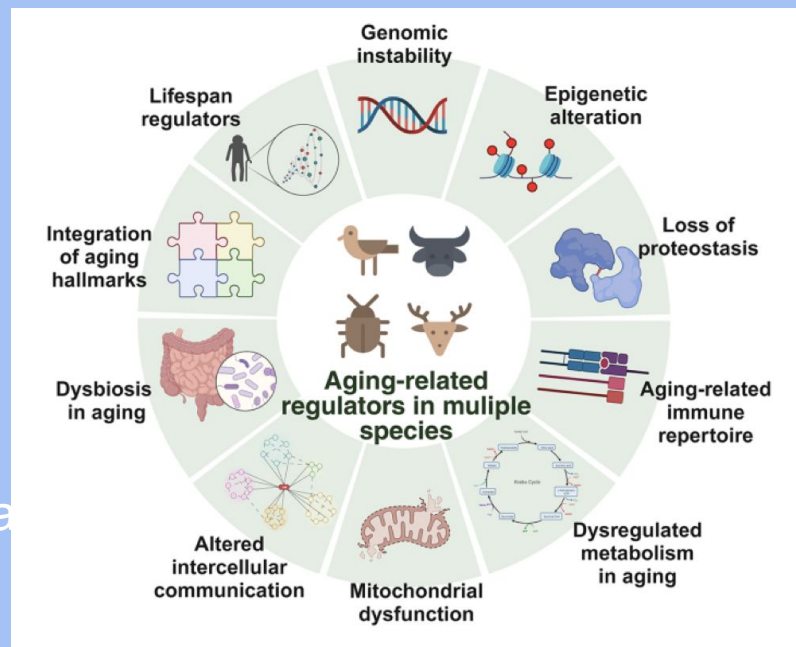
 <p>Genomic instability</p>	 <p>Epigenetic alterations</p>	 <p>Loss of proteostasis</p>	 <p>Aging-related immune repertoire</p>	 <p>Dysregulated metabolism in aging</p>	
 <p>Mitochondrial dysfunction</p>	 <p>Altered intercellular communication</p>	 <p>Dysbiosis in aging</p>	 <p>Integration of aging hallmarks</p>	 <p>Anti-aging interventions</p>	 <p>Lifespan regulators</p>

**Browse by Species**

 <p>Human</p>	 <p>Mouse</p>	 <p>Rat</p>	 <p>Rhesus macaque</p>	 <p><i>Drosophila melanogaster</i></p>	 <p><i>Caenorhabditis elegans</i></p>	 <p><i>Chlorocebus aethiops</i></p>	 <p><i>Danio rerio</i></p>	 <p><i>Nothobranchius furzeri</i></p>
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# What are the impacts of the AgeAnnoMo database to the scientific community?

- AgeAnnoMO provides information about the various age-contributing factors in different species
- Allows users to directly access different aging hallmarks or a particular species of interest
- It contains age-related genes, proteins, metabolites, mitochondrial genes, microbiota and age-specific TCR and BCR sequences relating to aging for 50 different species.





# Data is collected from larger databases

- An example of a larger database would be NCBI and Uniprot



NCBI logo | GEO Gene Expression Omnibus logo

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NCBI > GEO > **Accession Display** [?](#) | Not logged in | [Login](#) [?](#)

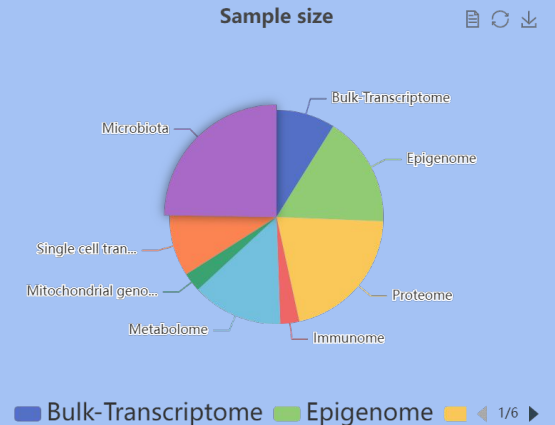
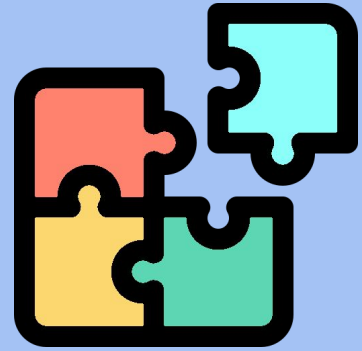
Scope:  Format:  Amount:  GEO accession:

- Datasets are then organized using the AgeAnnoMo ID

Dataset ID ↕	Species ↕	Tissue ↕	Project_ID ↕	Sequencing_technique ↕	Result Page
AMO-BT-001	Caenorhabditis. elegans	Whole body	GSE101964	RNA sequencing using Illumina HiSeq 2000	<a href="#">Detail</a>

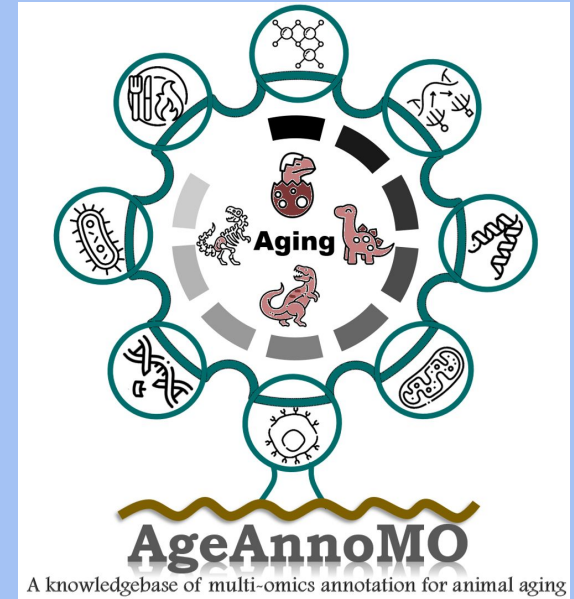
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# This database is not reliable and unorganized

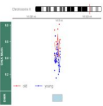
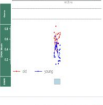
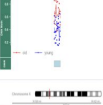
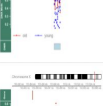

- The website appears to be well-organized on the exterior.
- When clicking on the subject of interest, the data is unclear. For many of the species, after clicking on one, very little information is given with no context.
- No other information is given, such as what the sequencing technique was used for, etc. This leaves users confused and with little information to analyze.



Uniprot_entry ⇅	Name ⇅	Category ⇅	P.Value ⇅	adj.P.Val ⇅	logFC ⇅	Up_or_down ⇅
008992	SDCBP	old vs young	0.03046	0.2891	1.748	UP

# AgeAnnoMO is not user friendly

- Nothing is hyperlinked.
- Data displayed is unclear.

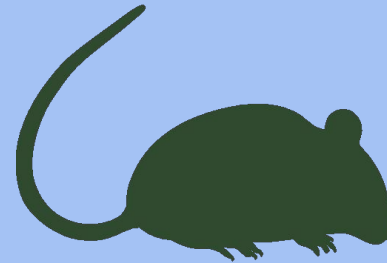
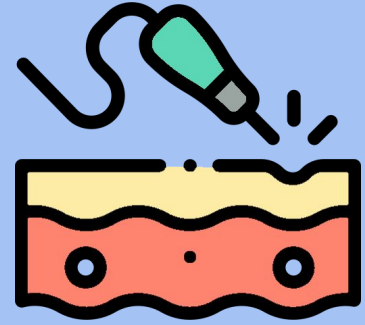
Symbol	Entrez ID	Animal	Tissue	Chromosome	Start	End	Age_groups	Diff_Methy	Methylation Type	Picture
TSC22D3	14605	Mouse	Adipose	chrX	140598826	140600569	Aged vs Young	0.224	hypermethylation	
MIR3475	100499512	Mouse	Adipose	chrX	140277632	140278646	Aged vs Young	0.268	hypermethylation	
BEGAIN	380785	Mouse	Adipose	chr12	109033162	109034211	Aged vs Young	0.369	hypermethylation	
PGRMC1	53328	Mouse	Adipose	chrX	36597945	36599006	Aged vs Young	0.368	hypermethylation	
UBQLN2	54609	Mouse	Adipose	chrX	153498046	153498857	Aged vs Young	0.3	hypermethylation	

- The data is not convenient to download, it comes in the form of excel files.

	A	B	C	D	E	F	G	H	I	J	K
1	Group	frequency	CDR3nt	CDR3aa	V	D	J	Animal	Tissue	Dataset.ID	Pubmed
2	Aged	0.237211	TGTGCTAGI	CASSGANT	TRBV29	TRBD1	TRBJ2-5	Mouse	Liver	AMO-TB-00	33271118
3	Aged	0.217405	TGTGCCAG	CASSLWNS	TRBV12-2	None	TRBJ1-6	Mouse	Liver	AMO-TB-00	33271118
4	Aged	0.071424	TGTGCTAGI	CASSFPDR	TRBV29	TRBD1	TRBJ1-1	Mouse	Liver	AMO-TB-00	33271118
5	Aged	0.057481	TGTGCTGT	CAWSRDRE	TRBV31	TRBD1	TRBJ1-4	Mouse	Liver	AMO-TB-00	33271118
6	Aged	0.041319	TGTGCCAG	CASSGGQT	TRBV13-3	TRBD1	TRBJ1-2	Mouse	Liver	AMO-TB-00	33271118
7	Aged	0.037961	TGTGCCAG	CASSDTGD	TRBV13-1	TRBD1	TRBJ1-4	Mouse	Liver	AMO-TB-00	33271118
8	Aged	0.037451	TGTGCCAG	CASSDAGE	TRBV13-1	None	TRBJ2-3	Mouse	Liver	AMO-TB-00	33271118
9	Aged	0.023808	TGTGCTAGI	CASRRGR	TRBV17	TRBD1	TRBJ2-2	Mouse	Liver	AMO-TB-00	33271118
10	Aged	0.022159	TGTGCTAGI	CASSLSAG	TRBV29	TRBD2	TRBJ2-4	Mouse	Liver	AMO-TB-00	33271118
11	Aged	0.02108	TGCACCTGT	CTCSADPP	TRBV1	TRBD2	TRBJ2-5	Mouse	Liver	AMO-TB-00	33271118
12	Aged	0.0191	TGTGCCAG	CASSLAGQ	TRBV12-2	TRBD1	TRBJ1-2	Mouse	Liver	AMO-TB-00	33271118
13	Aged	0.016309	TGTGCTAGI	CASSGGG	TRBV29	TRBD1	TRBJ1-1	Mouse	Liver	AMO-TB-00	33271118
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16	Aged	0.012654	TGTGCTAGI	CASSSTDC	TRBV29	TRBD1	TRBJ2-5	Mouse	Liver	AMO-TB-00	33271118
17	Aged	0.011514	TGTGCCAG	CASSGTGV	TRBV13-1	TRBD2	TRBJ2-7	Mouse	Liver	AMO-TB-00	33271118
18	Aged	0.010584	TGTGCTAGI	CASRGQNC	TRBV29	TRBD1	TRBJ1-5	Mouse	Liver	AMO-TB-00	33271118
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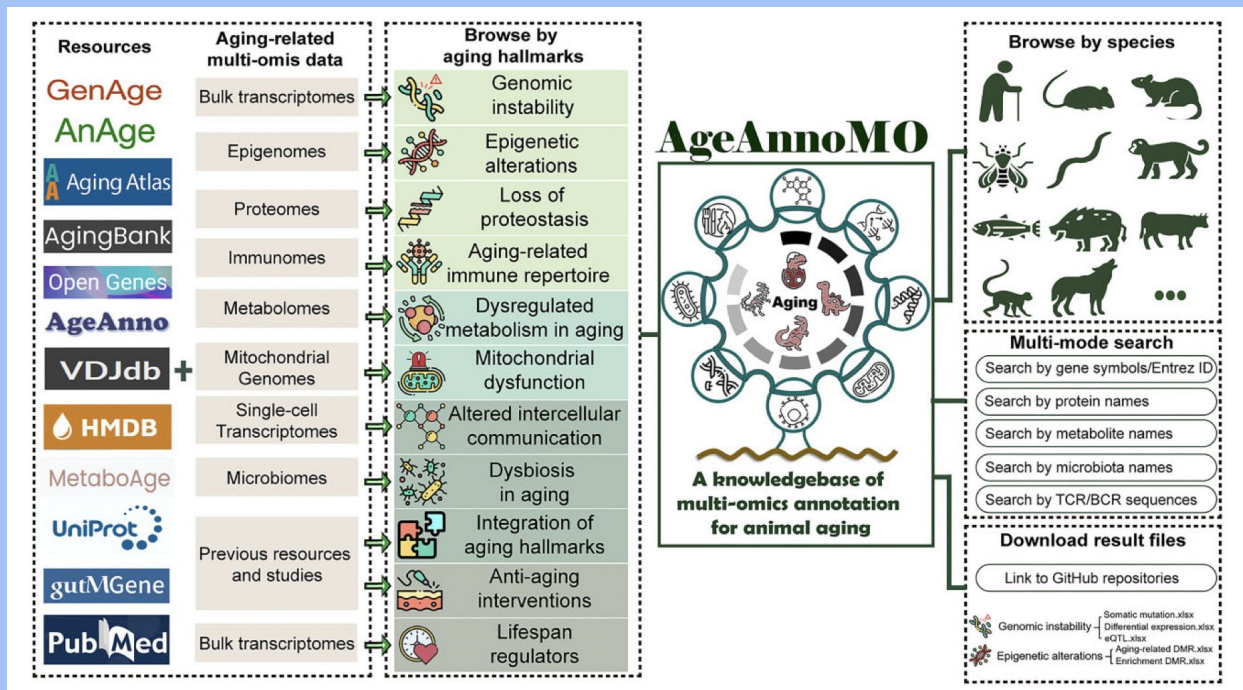
# The database content is timely

- This databases is curated by in house staff, not community curation.
- AgeAnnoMO is a database available to the public.
- The database first went online in 2015.
- This database is updated yearly, with publications spanning from 2015 to most recently 2023.
- There has been nothing new in 2024 published.



# Summary

- Claims to be a useful resource to the scientific community, however, upon further evaluation it does not efficiently organize, simplify or organize data.



# Acknowledgements:

AgeAnnoMO

<https://relab.xidian.edu.cn/AgeAnnoMO/#/>

[https://watermark.silverchair.com/gkad884.pdf?token=AQECAHi208BE49Ooan9kkhW\\_Ercy7Dm3ZL\\_9Cf3qfKAc485ysgAAA2swggNnBgqghkiG9w0B\\_BwaqqgNYMIIDVAIBADCCA00GCSqGSib3DQEHATAeBglghkgBZQMEAS4wEQQMxCB57qmpESekSOCedAgEQgIIDHuCYgOmtCQ0jfUfhmpyDmfwygHnwR1uo2I\\_g\\_dEVZkEAOc3d0W4DE3s7W9JO0oI\\_Tmxmv6ajKmF5ceLCFDwKpCLdoeovWdZIJEA4CuDC9JfG0zG8MawP5ZieA4DvtAWHohIDJb273ruahC0GWWggKqvGEoShRNiDDnVz2cMZ9jc-HBMAJx9VbrX9bKyL2mbqMwoTqVE9CcmUgzv75tLcLGH2XTLoydsfsHd00Y18rxE8BVFLHwLDBtGrP19frQihvFFF3RZjTHXDtA6r-79grpUd1mYBwKCloHmZS4lu-8oinYFYPV2FGBCU\\_N3fAs2MNFrN3E5VgoK9aNNqcPekEus1\\_xtxRuUTaJcMy7zJv\\_eC2X7RmxDYY341uhHbe\\_HwVQJ\\_mZ2-L25ckw5bS3DZXwV2YOIUoCJ8xe7FfxPzK7LGw1O6nBDpPpAVOIWGHkYcy3A5ZxaSJBoYKkiA3Qr2mr4\\_MP2waQ2kH4Ufwil25a1tH8Hn\\_dtQkQPtFfnyrBbin9UBeBZ49nibqL\\_GJSuoNKbF7VI3Z3QJHxf74hh6ceDaSgySOKWQwMLTDcjS8FClnATt7UxdgDDJPhakVj1MjT6Lc6cGc3uyKopGTTwAz8LwxPE5mVg2TAW8XSnvPsi6jSCEAct6AWk8R9eHtgoAGoupBno2DPkYvicUsUXdDNdn2YluK6SRg8RcvRH\\_WKhdDaSSFkxsXp8STDKfd1DvS45dxCPM\\_jjn0o0lb7-djtYxP-xPVwugHJJ3vdKGihqpMiyf1xhYjTppiGBwLf5a\\_cUKb6fx2IB0A9jwFhhXXhw30HCOzZc9DIGhS1JhX-urY0dxJTnC2lx1H8gLXbQuIq8phNedj3Kc9ME9Pk\\_IXFSIOasGv6GMiVVfoc4Xb-u08m5c5hR8Y3ZnCMcvbcDhjWxe1kqeJ19oIkvy1dppls1vpxQqrm9Mn9O\\_SIOZ0oNi\\_0EYIirH25LFBA4td3DxkNFTQOTHSByblp997nZo6UIkPbgOLoyOn9Mk19ClgdYaEq8\\_nIO9hAaN-mm64mSn020-id\\_WgAQaeMRgJ-I00IlaNg](https://watermark.silverchair.com/gkad884.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_9Cf3qfKAc485ysgAAA2swggNnBgqghkiG9w0B_BwaqqgNYMIIDVAIBADCCA00GCSqGSib3DQEHATAeBglghkgBZQMEAS4wEQQMxCB57qmpESekSOCedAgEQgIIDHuCYgOmtCQ0jfUfhmpyDmfwygHnwR1uo2I_g_dEVZkEAOc3d0W4DE3s7W9JO0oI_Tmxmv6ajKmF5ceLCFDwKpCLdoeovWdZIJEA4CuDC9JfG0zG8MawP5ZieA4DvtAWHohIDJb273ruahC0GWWggKqvGEoShRNiDDnVz2cMZ9jc-HBMAJx9VbrX9bKyL2mbqMwoTqVE9CcmUgzv75tLcLGH2XTLoydsfsHd00Y18rxE8BVFLHwLDBtGrP19frQihvFFF3RZjTHXDtA6r-79grpUd1mYBwKCloHmZS4lu-8oinYFYPV2FGBCU_N3fAs2MNFrN3E5VgoK9aNNqcPekEus1_xtxRuUTaJcMy7zJv_eC2X7RmxDYY341uhHbe_HwVQJ_mZ2-L25ckw5bS3DZXwV2YOIUoCJ8xe7FfxPzK7LGw1O6nBDpPpAVOIWGHkYcy3A5ZxaSJBoYKkiA3Qr2mr4_MP2waQ2kH4Ufwil25a1tH8Hn_dtQkQPtFfnyrBbin9UBeBZ49nibqL_GJSuoNKbF7VI3Z3QJHxf74hh6ceDaSgySOKWQwMLTDcjS8FClnATt7UxdgDDJPhakVj1MjT6Lc6cGc3uyKopGTTwAz8LwxPE5mVg2TAW8XSnvPsi6jSCEAct6AWk8R9eHtgoAGoupBno2DPkYvicUsUXdDNdn2YluK6SRg8RcvRH_WKhdDaSSFkxsXp8STDKfd1DvS45dxCPM_jjn0o0lb7-djtYxP-xPVwugHJJ3vdKGihqpMiyf1xhYjTppiGBwLf5a_cUKb6fx2IB0A9jwFhhXXhw30HCOzZc9DIGhS1JhX-urY0dxJTnC2lx1H8gLXbQuIq8phNedj3Kc9ME9Pk_IXFSIOasGv6GMiVVfoc4Xb-u08m5c5hR8Y3ZnCMcvbcDhjWxe1kqeJ19oIkvy1dppls1vpxQqrm9Mn9O_SIOZ0oNi_0EYIirH25LFBA4td3DxkNFTQOTHSByblp997nZo6UIkPbgOLoyOn9Mk19ClgdYaEq8_nIO9hAaN-mm64mSn020-id_WgAQaeMRgJ-I00IlaNg)